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EDITED BY

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
ALVERSTONE, HAMPSHIRE



Editor

THE ADOPTION OF THE METRIC SYSTEM BY THE ROYAL MELBOURNE HOSPITAL*

BY
CHARLES B. MACGILLIVRAI

It is about eighty years since the medical profession and veterinary suggested the use of the Metric system, but little progress in implementing that change was given until after the end of World War II. The support given to the use of the Metric system in medicine has been evident in the post-war publication of the British Pharmacopoeia. In 1951 the British Pharmacopoeia indicated the doses of drugs in the Metric system with the Imperial equivalents and the tendency to change has been confirmed in the B.P. 1958. The introduction to the British Pharmacopoeia 1958 states: "Doses are expressed in the Metric system only except for those substances and preparations commonly prescribed in the Imperial system. The Commission has expressed the view that arrangements should be made so that the Imperial system of dosing might be abandoned in the next edition of the Pharmacopoeia."

When in 1956 the Editorial Committee revised the Royal Melbourne Hospital Manual, which includes the hospital pharmacopoeia, it decided that the Metric system would be adopted, as soon as possible, for use in the hospital. All doses of drugs and formulae of preparations were written in the Metric system without Imperial equivalents being indicated. It should be noted that this is the first instance that all doses and formulae in the Imperial system were omitted from the hospital pharmacopoeia. The pharmacy staff gave their full support to this advance in prescription writing. Though it would be untrue to say that the staff as a whole did not like the system based on it is much more convenient than the British system in that the multiples and submultiples being in the decimal system, which once it is used in addition and subtraction are expressed as the decimal of one, dozen, hundred and so on in several. Again the measures of area and volume are simply related to those of length and the gram is so chosen as to be the weight of 1 c.c. of water at the point of maximum density. The pharmacist prefers the Metric system for its simplicity in calculations with the decimal point displacing the fraction. Percentage solutions are obviously displaced because of the direct relationship of the gram and the millilitre and no more does the apothecary become confused over the grain and the ounce.

The British Pharmacopoeia 1958 forces the dispensing chemist to use metric measurements of he is to dispense accurately the 121 drugs for which metric doses only are given. Now that we are using milligrams and grams in measurements of weight and millilitres as a measure of volume we

*We are grateful to the Editor, *The Australian Journal of Pharmacy*, and the author, Mr. C. B. Macgillivray, for permission to reprint this article in the Metric system, published in the October 1958 issue of *The Australian Journal of Pharmacy*.

try it), to dispose of grams, ounces and pounds as well as meters and millimeters, meters thereby making the duplication of two systems of weights and measures unnecessary.

It was expected that with the introduction of the Metric system to the hospital in the hospital that the, i.e., by the nursing staff, of meters and fluid ounces, in relation as well as the domestic household measures of teaspoonful and tablespoonful would cease. The use of milliliters as a volume measurement would mean that the nursing staff would have only one system to control units. It would be of great advantage to the nurse for all fluid intake and food weight measurements would be in the same system as the individual dose for the patient. The result of this will mean that the transfer nurse will only be required to learn one system of fluid measurement. Difficulty would have been experienced in using the milliliter as a dosage measurement for comparisons so it was decided to retain the domestic measures of teaspoonful and table-spoonful for the system of the hospital.

Another reason that prompted the adoption of the Metric system was that the hospital has a responsibility as a teaching institution to instruct the students in the Metric system. It was definitely expected that as the medical students were trained in this system that they would become doctors who would inevitably use the Metric system in their prescriptions writing programs, had shown that pharmacists were not familiar with the Metric system and that most of them used the laborious method of converting metric doses to imperial doses before dispensing the prescriptions. It was likewise confidently anticipated that pharmacists after a period at the hospital would gain confidence in using Metric weights and measures.

Further support to the adoption of the Metric system was given by medical literature and drug manufacturers. All new products being sold have dosage expressed in the Metric system so that the relationship between drugs of similar therapeutic action is readily seen. No longer will we have drugs with similar therapeutic action expressed in different systems so that the relation of their doses cannot readily be seen. Penicillin diphenyl has a maintenance dose of 1 to 12 grams (just 30 to 90 mg.) but Depone has a maintenance dose of 0.25 mg. (just 1/320 gram) once or twice daily. It now becomes the duty of all pharmacists to embrace this system and to end this confusion of the Imperial, the Avordupois and Apothecaries systems. When the dispensing doctors adopt the Metric system entirely it will no longer be necessary to state on the label that the strength of the morphine sulphate must be 0.1 gram or 1 gral. How much more correct will it be to state that the strength is 10 mg. or 1 cl.

PRELIMINARY ORGANIZATION

At a conference of medical staff personnel presided over by the medical Superintendent the problems which would be created by the introduction of the Metric system were discussed. It was soon evident that the greatest danger was that of poorer technique which might develop as difficult as were

unrehearsed. I never realized it until I wrote, "Converting Libras to Kilos and Kilos to Grams, Familiar with the Operations." Metric operations in the Imperial circumstances. Previous action was taken by suggesting to the staff conference that everybody should be encouraged to think in the Metric system for as this was done on the runway to convert from Metric to the Imperial system would come.

The following decisions were undertaken:

(1) All fluid intake and output would be measured and recorded in the Metric system.

(2) All body temperatures were to be taken and recorded in degrees Centigrade.

(3) The height of patients was to be measured and recorded in centimeters.

(4) Body weights were to be recorded in kilograms.

(5) A Metric Conversion Table of approximate equivalents was to be prepared. This table would provide a standard for use by the nursing staff and would show the equivalent Fahrenheit for a recorded Centigrade temperature, the equivalent of meters and pounds to a recorded kilogram body weight and the equivalent in feet and inches to a height recorded in centimeters.

(6) The Pharmacy was instructed to change all word labels showing Imperial measurements to metric measurements:

Grams to milligrams (mg.)

Ounces to Grams (G.)

Minims to milliliters (ml.)

Fluid ounces to milliliters (ml.)

One teaspoonful to 4 milliliters (4 ml.)

Two teaspoonfuls to 8 milliliters (8 ml.)

One tablespoonful to 15 milliliters (15 ml.)

(7) The resident medical staff were to be instructed to use the Metric system.

(8) The co-operation of the honorary medical staff was to be sought and they were to be asked to change their prescribing to the Metric system.

(9) The date for the change over would be midnight of 30th April so that all hospital records from the 1st May 1959 would be in Metric system.

The Patients on Experiments

(1) *Fluid Intake*—Clear plastic paper shaped with a pointer tip and graduated in milliliters were provided.

Fluid Output—Opaque plastic paper graduated in milliliters and of a different shape to those used for fluid intake were provided.

Smaller sized paper that went in use and graduated in fluid ounces and pints and cubic centimeters were recorded in milliliters and liters.

All the equipment was delivered prior to 26th April and on 1st May all Imperial measures were withdrawn.

(2) Centigrade thermometers were issued to wards and Fahrenheit thermometers were withdrawn.

(3) The height register graduated in the Imperial system was retained but

a beam and graduated in milligrams was affixed to the present anaesthetic gauge.

(4) It was not possible enough at present time, to convert the present patients weighing scales to the Metric system so the nursing staff were instructed to weigh on the present scale, convert the corresponding weight to the Metric equivalent and record the weight in the Metric system.

(5) Tables, showing approximate equivalents were posted on both the front and reverse sides of a folded card. The various tables showed:

- (a) The approximate Fahrenheit temperatures to Centigrade. The range of temperatures were from 35.0 C. to 45.0 C.
- (b) The equivalent kilogram weight for stones and pounds. The range of weights commenced at 3.7 kg. (5 lb.) and went through to 55.5 kg. (144 lb.). Any weight greater than this could be calculated from the table.
- (c) A measurement of length commencing at 91.4 cm. (3 ft.) and ranged to 182.9 cm. (6 ft.).
- (d) Approximate equivalents of fluid ounces and millilitres, also ounces and millilitres.
- (e) Approximate equivalents of ounces/grams (Avoirdupois) to grams/milligrams.
- (f) A Table of Metric Weights and Volumes.
- (g) Approximate equivalents for dosing purposes related to the domestic measures of teaspoonful and table-spoonful.
- (h) A percentage dilution table.

A copy of the tables is given at the end of the article.

RECONSTRUCTION OF PHARMACY STOCKS

It may be of interest to hospital pharmacists to learn of the method by which pharmacy stock labelled in the Imperial system was changed over to the Metric system. Much preliminary consultation had been done prior to the change, made on 1st May. Labels with doses of ingredients in the Imperial system were withdrawn and new labels showing all doses of ingredients in Metric were obtained. As new stock for wards and departments was packed the Metric labels were attached. For a short period prior to 1st May 1958, it was necessary to use the domestic measure of one teaspoonful or one table-spoonful on the label and the metric dose of 4.9 ml. or 15 ml. was marked out.

On the evening of 30th April, commencing at 7 p.m. qualified pharmacists assisted by apprentices, under the direction of the Chief Pharmacist, visited the departments and wards throughout the hospital. The drug cupboards in each department and ward were inspected and any drugs labelled in the Imperial system had the labels changed to the Metric system. Uniformity in equivalent doses was secured by the use of the B.M.H. Metric Conversion Table, Approximate Equivalents. The task was completed by 9.30 p.m. The hospital was thus assured of correct metric equivalents, no wastage of stock, no

interruption in the drug treatment of patients and no inconvenience to the nursing staff.

The ease of implementation of the Metric system assisted all. The medical and nursing staff co-operated with the pharmacy staff and the change over was effected without disturbance or irritation. In the change over period from the Imperial to the Metric system comparisons were permitted, but this period must be limited. All the Imperial system methods and measures must be abolished. The pharmacist must no longer dispense his prescriptions by converting the Metric measurements to Imperial equivalents and he will dispense of his Imperial weights and measures. The Royal Melbourne Hospital Metric Conversion Table of Approximate Equivalents will not be reproduced as it was intended only as a means of helping the staff to relate the Imperial and Metric systems of measurements.

The Metric system has now been in operation for five months and is regarded as the normal measuring system. It is hoped that the Metric system will be adopted by other hospitals, doctors and pharmacists generally. It is confidently anticipated that doctors, nurses and pharmacists trained at the Royal Melbourne Hospital will go out into the world and change all pertaining to the Metric system. All our efforts will be so that if the Metric system remains unswayed by the general practitioner and the family doctor. We look hopefully for an universal adoption so that doctors and pharmacists will be able to realize the full advantages of this system.

We at the Royal Melbourne Hospital have welcomed the adoption of the Metric system and now that we have learnt to think in this system we are making its many advantages over the outmoded Imperial system.

Our appeal now is to the dispensing chemist to follow the lead given by this hospital and in every way endeavour to encourage the use of the Metric system in dispensing.

Form of Card—Column 1

THE ROYAL MELBOURNE HOSPITAL METRIC CONVERSION TABLE (Approximate Equivalents Only)

Column 2

FOR INFORMATION ONLY TABLE OF METRIC WEIGHTS AND VOLUMES

1000 (carriage) mg are 1 kilogram (kg.)
1000 mg are 1 gram (g.)
1000 g are 1 kilogram (kg.)
1 cubic centimetre (c.c.) is equal to 1 millilitre (ml.)
1000 ml are 1 litre (l.)

APPROXIMATE EQUIVALENTS FOR DISPENSING PURPOSES METRIC MEASURES

Metric Measurements		IMPERIAL TABLES	
		1 st , 10 ml diluted to 1000 ml (1 in 100)	2 nd , 4 ml diluted to 1000 ml (1 in 250)
One teaspoonful	5 ml	0.5	0.1
Two teaspoonfuls	10 ml	1.0	0.2
One tablespoonful	15 ml	1.5	0.3
Two tablespoonfuls	30 ml	3.0	0.6

0.001", 0.1 ml diluted to 1000 ml (1 in 100000)

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1. *Journal of Management Studies*, 1996, 33, 1, 1-14.

100.0 C	999.9 F	484.3 C	903.7 F
105.0 C	221.0 F	489.3 C	912.7 F
110.0 C	230.0 F	494.3 C	921.7 F
115.0 C	239.0 F	499.3 C	930.7 F
120.0 C	248.0 F	504.3 C	939.7 F
125.0 C	257.0 F	509.3 C	948.7 F
130.0 C	266.0 F	514.3 C	957.7 F
135.0 C	275.0 F	519.3 C	966.7 F
140.0 C	284.0 F	524.3 C	975.7 F
145.0 C	293.0 F	529.3 C	984.7 F
150.0 C	302.0 F	534.3 C	993.7 F
155.0 C	311.0 F	539.3 C	1002.7 F
160.0 C	320.0 F	544.3 C	1011.7 F
165.0 C	329.0 F	549.3 C	1020.7 F
170.0 C	338.0 F	554.3 C	1029.7 F
175.0 C	347.0 F	559.3 C	1038.7 F
180.0 C	356.0 F	564.3 C	1047.7 F
185.0 C	365.0 F	569.3 C	1056.7 F
190.0 C	374.0 F	574.3 C	1065.7 F
195.0 C	383.0 F	579.3 C	1074.7 F
200.0 C	392.0 F	584.3 C	1083.7 F
205.0 C	401.0 F	589.3 C	1092.7 F
210.0 C	410.0 F	594.3 C	1101.7 F
215.0 C	419.0 F	599.3 C	1110.7 F
220.0 C	428.0 F	604.3 C	1119.7 F
225.0 C	437.0 F	609.3 C	1128.7 F
230.0 C	446.0 F	614.3 C	1137.7 F
235.0 C	455.0 F	619.3 C	1146.7 F
240.0 C	464.0 F	624.3 C	1155.7 F
245.0 C	473.0 F	629.3 C	1164.7 F
250.0 C	482.0 F	634.3 C	1173.7 F
255.0 C	491.0 F	639.3 C	1182.7 F
260.0 C	500.0 F	644.3 C	1191.7 F
265.0 C	509.0 F	649.3 C	1200.7 F
270.0 C	518.0 F	654.3 C	1209.7 F
275.0 C	527.0 F	659.3 C	1218.7 F
280.0 C	536.0 F	664.3 C	1227.7 F
285.0 C	545.0 F	669.3 C	1236.7 F
290.0 C	554.0 F	674.3 C	1245.7 F
295.0 C	563.0 F	679.3 C	1254.7 F
300.0 C	572.0 F	684.3 C	1263.7 F
305.0 C	581.0 F	689.3 C	1272.7 F
310.0 C	590.0 F	694.3 C	1281.7 F
315.0 C	599.0 F	699.3 C	1290.7 F
320.0 C	608.0 F	704.3 C	1299.7 F
325.0 C	617.0 F	709.3 C	1308.7 F
330.0 C	626.0 F	714.3 C	1317.7 F
335.0 C	635.0 F	719.3 C	1326.7 F
340.0 C	644.0 F	724.3 C	1335.7 F
345.0 C	653.0 F	729.3 C	1344.7 F
350.0 C	662.0 F	734.3 C	1353.7 F
355.0 C	671.0 F	739.3 C	1362.7 F
360.0 C	680.0 F	744.3 C	1371.7 F
365.0 C	689.0 F	749.3 C	1380.7 F
370.0 C	698.0 F	754.3 C	1389.7 F
375.0 C	707.0 F	759.3 C	1398.7 F
380.0 C	716.0 F	764.3 C	1407.7 F
385.0 C	725.0 F	769.3 C	1416.7 F
390.0 C	734.0 F	774.3 C	1425.7 F
395.0 C	743.0 F	779.3 C	1434.7 F
400.0 C	752.0 F	784.3 C	1443.7 F
405.0 C	761.0 F	789.3 C	1452.7 F
410.0 C	770.0 F	794.3 C	1461.7 F
415.0 C	779.0 F	799.3 C	1470.7 F
420.0 C	788.0 F	804.3 C	1479.7 F
425.0 C	797.0 F	809.3 C	1488.7 F
430.0 C	806.0 F	814.3 C	1497.7 F
435.0 C	815.0 F	819.3 C	1506.7 F
440.0 C	824.0 F	824.3 C	1515.7 F
445.0 C	833.0 F	829.3 C	1524.7 F
450.0 C	842.0 F	834.3 C	1533.7 F
455.0 C	851.0 F	839.3 C	1542.7 F
460.0 C	860.0 F	844.3 C	1551.7 F
465.0 C	869.0 F	849.3 C	1560.7 F
470.0 C	878.0 F	854.3 C	1569.7 F
475.0 C	887.0 F	859.3 C	1578.7 F
480.0 C	896.0 F	864.3 C	1587.7 F
485.0 C	905.0 F	869.3 C	1596.7 F
490.0 C	914.0 F	874.3 C	1605.7 F
495.0 C	923.0 F	879.3 C	1614.7 F
500.0 C	932.0 F	884.3 C	1623.7 F
505.0 C	941.0 F	889.3 C	1632.7 F

[illegible]

Column 3—(End of Line)

COMPARISON OF STONES AND POUNDS TO KILOGRAMS (kg)

1 lb	0.45	11.7 kg	1 lb	0.45	51.7 kg
1 lb	1 lb	12.1 kg	1 lb	4 lb	52.4 kg
1 lb	2 lb	12.4 kg	1 lb	4 lb	53.5 kg
1 lb	3 lb	13.6 kg	1 lb	8 lb	54.4 kg
1 lb	4 lb	13.7 kg	1 lb	16 lb	55.5 kg
1 lb	5 lb	14.0 kg	1 lb	32 lb	56.2 kg
1 lb	6 lb	14.4 kg	1 lb	64 lb	57.1 kg
1 lb	7 lb	14.8 kg	1 lb	128 lb	58.0 kg
1 lb	8 lb	15.2 kg	1 lb	256 lb	58.9 kg
1 lb	9 lb	15.5 kg	1 lb	512 lb	59.8 kg
1 lb	10 lb	15.7 kg	1 lb	1024 lb	60.7 kg
1 lb	11 lb	15.9 kg	1 lb	2048 lb	61.6 kg
1 lb	12 lb	16.1 kg	1 lb	4096 lb	62.5 kg
1 lb	13 lb	16.4 kg	1 lb	8192 lb	63.4 kg
1 lb	14 lb	16.1 kg	1 lb	16384 lb	64.3 kg
1 lb	1 lb	16.5 kg	1 lb	32768 lb	65.2 kg
1 lb	2 lb	16.8 kg	1 lb	65536 lb	66.1 kg
1 lb	3 lb	16.9 kg	1 lb	131072 lb	67.0 kg
1 lb	4 lb	16.9 kg	1 lb	262144 lb	67.9 kg
1 lb	5 lb	17.0 kg	1 lb	524288 lb	68.8 kg
1 lb	6 lb	17.1 kg	1 lb	1048576 lb	69.7 kg
1 lb	7 lb	17.2 kg	1 lb	2097152 lb	70.6 kg
1 lb	8 lb	17.3 kg	1 lb	4194304 lb	71.5 kg
1 lb	9 lb	17.3 kg	1 lb	8388608 lb	72.4 kg
1 lb	10 lb	17.4 kg	1 lb	16777216 lb	73.3 kg
1 lb	11 lb	17.5 kg	1 lb	33554432 lb	74.2 kg
1 lb	12 lb	17.5 kg	1 lb	67108864 lb	75.1 kg
1 lb	13 lb	17.6 kg	1 lb	134217728 lb	76.0 kg
1 lb	14 lb	17.6 kg	1 lb	268435456 lb	76.9 kg
1 lb	15 lb	17.6 kg	1 lb	536870912 lb	77.8 kg
1 lb	16 lb	17.7 kg	1 lb	1073741824 lb	78.7 kg
1 lb	17 lb	17.7 kg	1 lb	2147483648 lb	79.6 kg
1 lb	18 lb	17.7 kg	1 lb	4294967296 lb	80.5 kg
1 lb	19 lb	17.8 kg	1 lb	8589934592 lb	81.4 kg
1 lb	20 lb	17.8 kg	1 lb	17179869184 lb	82.3 kg
1 lb	21 lb	17.8 kg	1 lb	34359738368 lb	83.2 kg
1 lb	22 lb	17.9 kg	1 lb	68719476736 lb	84.1 kg
1 lb	23 lb	17.9 kg	1 lb	137438953472 lb	85.0 kg
1 lb	24 lb	17.9 kg	1 lb	274877906944 lb	85.9 kg
1 lb	25 lb	18.0 kg	1 lb	549755813888 lb	86.8 kg
1 lb	26 lb	18.0 kg	1 lb	1099511627776 lb	87.7 kg
1 lb	27 lb	18.0 kg	1 lb	2199023255552 lb	88.6 kg
1 lb	28 lb	18.0 kg	1 lb	4398046511104 lb	89.5 kg
1 lb	29 lb	18.1 kg	1 lb	8796093022208 lb	90.4 kg
1 lb	30 lb	18.1 kg	1 lb	17592186044416 lb	91.3 kg
1 lb	31 lb	18.1 kg	1 lb	35184372088832 lb	92.2 kg
1 lb	32 lb	18.1 kg	1 lb	70368744177664 lb	93.1 kg
1 lb	33 lb	18.2 kg	1 lb	140737488355328 lb	94.0 kg
1 lb	34 lb	18.2 kg	1 lb	281474976710656 lb	94.9 kg
1 lb	35 lb	18.2 kg	1 lb	562949953421312 lb	95.8 kg
1 lb	36 lb	18.2 kg	1 lb	1125899906842624 lb	96.7 kg
1 lb	37 lb	18.3 kg	1 lb	2251799813685248 lb	97.6 kg
1 lb	38 lb	18.3 kg	1 lb	4503599627370496 lb	98.5 kg
1 lb	39 lb	18.3 kg	1 lb	9007199254740992 lb	99.4 kg
1 lb	40 lb	18.3 kg	1 lb	18014398509481984 lb	100.3 kg

1 lb equals 0.45 kg
 1 lb equals 0.27 kg
 1 lb equals 0.14 kg
 1 lb equals 0.08 kg

Column 5—(Back of Card)

CONVERSION OF FEET AND INCHES TO CENTIMETERS

0 ft.	0 in.	00.0 cm.	0 ft.	7 in.	177.8 cm.
0 ft.	1 in.	25.4 cm.	0 ft.	8 in.	203.2 cm.
0 ft.	2 in.	50.8 cm.	0 ft.	9 in.	228.6 cm.
0 ft.	3 in.	76.2 cm.	0 ft.	10 in.	254.0 cm.
0 ft.	4 in.	101.6 cm.	0 ft.	11 in.	279.4 cm.
0 ft.	5 in.	127.0 cm.	0 ft.	12 in.	304.8 cm.
0 ft.	6 in.	152.4 cm.	0 ft.	13 in.	330.2 cm.
0 ft.	7 in.	177.8 cm.	0 ft.	14 in.	355.6 cm.
0 ft.	8 in.	203.2 cm.	0 ft.	15 in.	381.0 cm.
0 ft.	9 in.	228.6 cm.	0 ft.	16 in.	406.4 cm.
0 ft.	10 in.	254.0 cm.	0 ft.	17 in.	431.8 cm.
0 ft.	11 in.	279.4 cm.	0 ft.	18 in.	457.2 cm.
0 ft.	12 in.	304.8 cm.	0 ft.	19 in.	482.6 cm.
0 ft.	1 in.	25.4 cm.	0 ft.	20 in.	508.0 cm.
0 ft.	2 in.	50.8 cm.	0 ft.	21 in.	533.4 cm.
0 ft.	3 in.	76.2 cm.	0 ft.	22 in.	558.8 cm.
0 ft.	4 in.	101.6 cm.	0 ft.	23 in.	584.2 cm.
0 ft.	5 in.	127.0 cm.	0 ft.	24 in.	609.6 cm.
0 ft.	6 in.	152.4 cm.	0 ft.	25 in.	635.0 cm.
0 ft.	7 in.	177.8 cm.	0 ft.	26 in.	660.4 cm.
0 ft.	8 in.	203.2 cm.	0 ft.	27 in.	685.8 cm.
0 ft.	9 in.	228.6 cm.	0 ft.	28 in.	711.2 cm.
0 ft.	10 in.	254.0 cm.	0 ft.	29 in.	736.6 cm.
0 ft.	11 in.	279.4 cm.	0 ft.	30 in.	762.0 cm.
0 ft.	12 in.	304.8 cm.	0 ft.	31 in.	787.4 cm.

1 inch equals 2.54 centimeters

Round as you

Size of card: 24 centimeters 14 centimeters, which is folded so 7 on front each
fold measures 8 centimeters 14 centimeters

[We are indebted to Mr. Macpherson for the foregoing article, which is also the subject of a guest editorial by Dr. F. N. O'Donnell, of the Royal Melbourne Hospital, *Comments* are invited.—*Editor: The Australian Journal of Pharmacy*, October 30, 1938.]

THE CORNELL MEDICAL INDEX

BY

Jesse Conant W. CULLEN, R.N.

Only men as well as the Royal Navy, each time and expensively sign all the names, or men who for one reason or another quickly break down and require to be discharged from the Service as suddenly as if before they have been able to make a contribution sufficient to justify them in economic point, the facilities the Service has assured on their behalf.

The scope of this problem can be gauged from the following figures:

TABLE I.

Date	Strength of R.N.	Number of lay patients on ships	Percentage discharged
1900	120,000	1,011	0.27
1905	125,000	1,000	0.39
1910	110,000	1,000	0.11
1915	100,000	1,129	0.29
1918	100,000	710	1

These figures for sickbeds expressed as a yearly basis as a percentage of the total force, are possibly not disturbing. But however when it is taken on the basis of five years and it is seen that a total of 7,170 men have been discharged from a force which has averaged 110,000 men total strength over this period, it is clear that there is a significant problem and that a substantial savings of public money and time is necessary. Anything that can be suggested to ease this problem is obviously worth consideration.

It is suggested that something more than the present system of medical examination on entry would be advantageous. This examination does weed out those with obvious or gross physical defects or bodily illness which can be detected quickly on routine medical examination. It largely ignores, however, questions of psychiastry, stress and in most instances the voluntariness of selection leads to great significant failures in the entrant's background and previous medical history. I do not intend to suggest that either the "entry medical officers" are inefficient or the new entrants purposefully deceitful, but the whole emphasis at the time of the medical examination is on enthusiasm for the Service and it may be that in the atmosphere unfavourable preparation factors in the entrant's constitutional make up as medical history do not receive the attention which they deserve. To overcome this apparent defect in the present entry system, some method of screening is called for in which

these unfavorable cases may be quickly skilled to utilize various screening either all across or in which there are symptoms which most have never noticed or the medical staff as what will generally be a time wasting and frustrating procedure.

Such a method of screening is available in the Cornell Medical Index Health Questionnaire.

This questionnaire is a series of 195 questions couched in simple and straightforward English with a minimum of technical terms and requiring a simple "Yes" or "No" answer given by making the appropriate response. The questions are grouped by "body systems" and quickly direct attention to any illness which the subject may have suffered from in the past or is suffering from at the moment. The answers to the questions when scored in full will also direct attention to the individual's reactions to illness and stress and give a significant indication of the subject's emotional stability and anxiety.

This system of sharing the past medical history of the subject is time-saving and economical of manpower. It requires no skilled administration; it can be quickly completed by a group at one time and it requires no skilled interpretation. The answer is quickly and easily seen and the Medical Officer is then able to concentrate to work on one subject point disclosed.

This point is fully made in an article in the *BMJ* in 1942 [1]. It is stated there that the average patient takes three or so minutes to complete the form and the doctor one or two minutes to score the results before he can and examine the patient. The points are also made that it often disclosed evidence of disease which was later overlooked in both an independent investigation and that physicians, by its use, can not only forecast practically all the diagnostic categories in which disease will later be discovered, but they can usually name the actual diseases which are present.

From a psychiatric point of view the questionnaire is also most valuable. It has been statistically determined that there is premonitory evidence of stress if the patient makes 30 or more "Yes" responses, if he answers three or more questions "Yes" and "No," if he omits the answer to six or more questions, and if he adds three or more "sometimes" or makes three or more changes to the questions.

In its relationship to stress analysis Tables II and III quoted by Bodansky, Erdman and Wolf, Cornell University 1935 would appear to give ample evidence of its value.

Table II [2]—The Relationship of the No or "Yes" Responses to the CHANGES IN CONSTITUTIONAL RESPONSE DURING ADULT LIFE.

	30 or more times during life	30 or more times during life
	No or Yes	No or Yes
Mean No. of life calls	1.7	1.6
Mean No. of days hospitalized	1.5	2.0
Mean No. of days absent	0.3	0.4
Percent of men hospitalized by cause mental	1.6	0.1
Percent of men discharged	1.2	0.0

TABLE 1.—The Cornell Medical Index: A Sample Questionnaire Form for Research Purposes

Number of "Yes" responses	2842 physicians' reports	251 patients' reports
1 or more	71	70
2 or more	44	44
3 or more	23	28
4 or more	14	21
5 or more	17	17
6 or more	11	10
7 or more	10	10
8 or more	4	4
9 or more	4	4
10 or more	3	4

The table reads, for example, at the scoring level of 25 (7 per cent) of the physicians' reports and 47 per cent of the patients' reports gave 70 or more "Yes" answers.

DISCUSSION

The need for a method which will quickly describe the subject's past medical history, present state and his attitude as illness and stress is well known to all Medical Officers and any system which will enable them to be assessed readily is worthy of consideration. The Cornell Medical Index provides such a method and while no one would claim that it is an infallible guide to either organic or psychogenic illness it does quickly present the possibility of such illness existing and allows special investigation and examination to be directed swiftly to the appropriate points.

The questionnaire method of obtaining information has of course certain defects and to some extent relies on the honesty of the subject in making his responses. However these defects should not be of great moment in a scoring such as the one suggested here, and there is the reassuring factor that responses which deviate from the accepted norms would be checked and investigated in any case.

It is considered that the Cornell Medical Index would be of particular advantage in increasing the fitness of the potential recruit for service and that it would not involve either any delay in the examination of the man or call for the expenditure of anything more than a very minor amount of public money and time—an expenditure which would be well worth while having regard to the saving which might be expected by eliminating potentially unfit men prior to entry.

SUMMARY

A short version of the Cornell Medical Index Health Questionnaire and its possible value as the quick assessment of potential recruits for the Service.

REFERENCES

- [1] The Human Index Inventory. (1952) R.M.J. 2, 476-478.
- [2] Bennett K. Edwards A. J. and Weiss H. G. (1953) Cornell Medical Index Medical Questionnaire. Cornell University N.Y. N.Y.

ANESTHETICS AFLOAT

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Surgeon Commander W. M. DAYTON, U.S.N.

When, at sea, it is decided that a surgical operation must be performed in order to save life or to avoid disability then the choice of anesthetic must be considered. This choice will depend on various factors such as:

- (a) The anesthetic experience of the medical officer
- (b) The anesthetic apparatus available
- (c) The anesthetic drugs available
- (d) Whether the medical officer is alone and therefore responsible for both giving the anesthetic and performing the operation

The Anesthetic Experience of the Medical Officer

Medical Officers, serving at sea, experienced in giving anesthetics will be guided by their own experience. This chapter is written for those medical officers who have had little anesthetic experience to serve as a guide as to what is at best, a worrying, and at worst, a potentially dangerous, situation.

The Anesthetic Apparatus Available

This may vary from a mask for open methods to a standard Boyle's apparatus with laryngoscope and endotracheal tubes. Whatever equipment is supplied it is most important to examine it at frequent intervals to ensure that it is in a satisfactory condition. It is too late to find faulty apparatus just before an emergency operation. Whatever apparatus is supplied for general anesthesia the following should also be available:

oropharyngeal airways, tongue forceps, mouth gag, sponge holding forceps, syringe of sodium citrate (1 ml. to 20 ml.) for local anesthetics and for I.V. anesthetics.

In addition a nasopharyngeal airway can be of great value in difficult cases of airway obstruction. A cut down endotracheal tube makes a good nasopharyngeal airway—its length should be equal to the distance between the tip of the nose and the lobe of the ear. A safety pin should be put through the end of the tube to prevent it from slipping down the nose.

The Anesthetic Drugs Available

These will vary with the anesthetic apparatus supplied. These should be sufficient drugs for the type of anesthesia contemplated. For example if only an open mask is supplied then the necessary drugs will be atropine for premedication, thiopentone ether and possibly chloroform. On the other hand if a field or standard Boyle's apparatus is supplied then there should be in addition to the above, supplies of nitrous oxide and oxygen cylinders.

telene, amonon and scopolamine compounds, and, if individual violation is contemplated, stimulants such as succinyl choline.

Medical Officer Responsible for Both the Anesthetist and the Surgeon

Where single handed the medical officer should always carry out the induction of anesthesia and when the desired plane of anesthesia is established hand over to a suit both attendant or to another officer. From then on he must control the maintenance of anesthesia by verbal instructions.

Local anesthesia should always be considered by the inexperienced anesthetist and only after its inclusion should a general anesthetic be administered. Most surgical operations can be performed under local anesthesia but some techniques require a considerable degree of skill and experience. Before attempting an operation under local anesthesia always give premedication of morphine, 1 gr. not later than 15 min. prior to the operation. The local and salt-4 local anesthetics at present in use is lignocaine hydrochloride (xylocaine). This drug can be used in strengths of 0.5 per cent. for infiltration, 1 per cent. for nerve block and 4 per cent. for topical anesthesia. Its action is rapid and lasts for two to three hours. Adrenaline 1:250,000 may be added but is not essential unless a very long operation is being undertaken. Adrenaline must never be used in the region of end arteries e.g. fingers and toes.

Maximum Strengths of Solutions

150 ml. of 0.5 per cent solution

50 ml. of 1.0 per cent solution

5 ml. of 4.0 per cent solution (topical anesthesia of mucous membrane only)

Procedures in Giving an Anesthetic

(1) *Preparation*—By law it is necessary to get consent to perform an operation and to administer a general anesthetic. In the Services this permission can be given by all personnel who have reached the age of 16 years—age 21. For those under 16 years of age the Captain in emergency may give consent in lieu of a parent or guardian.

This consent must be in writing and the signature must be witnessed. The standard form is as follows:

I, _____ of _____	hereby consent to my
undergo and submit the operation or treatment of _____ the	
effect and nature of which have been explained to me and to the witnesses	
one of a general or other anesthesia for this purpose.	
I also consent to such further or alternative operative treatment or treatment	
as may be necessary during the course of and directly connected with	
the operation or treatment.	
I understand that no treatment has been given that the operation will be	
performed by a particular surgeon	
Signed this _____ day of _____ 19 _____	
Witness's Signature _____	Signature _____
Surnames, Sigs and Rank/Rating	

(2) **Stomach Contents**—before giving a general anesthetic it is the responsibility of the anesthetist to ensure that the stomach is empty. It is generally accepted that the stomach will have emptied four to five hours after a meal. This period should have elapsed since the last food or drink was taken before the premedication is given. Morphine or morphine-like drugs may cause delay in stomach emptying. In the conscious it should be remembered that serious injuries cause delay in emptying so that even after eight or ten hours the stomach may not be empty. In these cases it is safer to assume that the time from the last meal to the time of the anesthetic gives the best guide to the probable state of the stomach contents.

In cases where the stomach may not be empty a tube should be passed and the stomach evacuated. A large tube such as No. 12 nasogastric tube should be used. A Ryle or Levine tube will be of little use unless the contents are fluid.

(3) **Teeth**—Ensure that dentures are removed before the patient is taken to the operating theatre. Make a note of loose or loose teeth and ensure they are still in place at the end of the operation.

(4) **Finger**—These should be removed to avoid injury to fingers while unconscious. If they cannot be removed cover with chloroform.

(5) **Premedication**—Premedication is given one to one and a half hours before operation and has two main objectives:

- (a) To sedate the patient and
- (b) the control of sympathetic effects.

A well-balanced patient will come to the theatre in a drowsy condition with a sense of well being and will require less anaesthetic to reach the desired level of anaesthesia. (Drugs used morphine, atropine, pethidine, barbiturate).

Paralysis of sympathetic effects (atropine, scopolamine) dry up the secretions which might interfere physically with the process interchange in the lungs, or cause laryngospasm by stimulation of ulcers, and also protect the heart against reflex vagal stimulation e.g. arrhythmias and possibly arrest.

Although atropine 1 gr and scopolamine 1/150 gr proven an effective premedication for most healthy young adults, each dose should be judged on an individual basis. The shocked or poor patient will not need much sedation, hence pethidine 20 mg. and atropine 1/150 gr may prove sufficient.

In severe degrees of shock drugs should be given intravenously because absorption of intramuscular or intramuscular injections may be delayed due to poor peripheral circulation, and may not take effect until recovery from shock is evident. Morphine compounds should only be given to relieve pain—when pain is absent give atropine 1/150 gr alone. If atropine and morphine are used dilute the morphine to 5 ml. with water and repeat slowly otherwise severe vomiting may occur causing further shock.

The premedication may have to be modified for the type of anaesthetic to be given and will be discussed under the various anaesthetic techniques.

Anaesthetic Techniques

It is assumed that ether will be the main anaesthetic for maintenance of

anesthesia and therefore a description of the stages of anesthesia, which are best seen when using are given below. With more "Modern" techniques these stages are masked to a great extent.

There are Four Stages of Anesthesia

Stage 1—From the beginning of induction to the loss of consciousness

Stage 2—From loss of consciousness to abolition of laryngeal reflex

Stage 3—From abolition of laryngeal reflex to paralysis of intercostal muscles

Stage 4—From paralysis of intercostal muscles to respiratory failure

It is during the second stage that most of the difficulties of induction occur. Muscular spasm occurs only in this stage and may give rise to breath holding, crowing phonation, spasm of jaw muscles, rigidity of limbs, spasm, clonus and peripartus movements. Coughing, salivation, swallowing, vomiting and retching may also occur in this stage. The eyelid reflex (attempted closure of the eye when the upper eyelid is lifted by the finger) is present and the eyeball shows marked movement. The size of the pupil is variable.

The third stage is called the Stage of Anesthesia and is subdivided into three planes which denote distinct levels of anesthesia. In the first plane, breathing ceases, a mechanical apnea, and is known as "anesthetic breathing." There is no coughing, swallowing, retching or vomiting. The eyelid reflex is absent and the movement of the eyeball gradually dies out at the lower border of the plane is reached. The muscles of the jaw and neck are relaxed but there is an abdominal relaxation and the patient may move in response to painful stimuli.

The second plane is characterized by the relaxation of the abdominal muscles and it is in this plane that most operations are performed. The eyeballs are motionless, the pupils conical and small. The base of the tongue tends to fall back and obstruct the airway due to complete relaxation of the muscles of the floor of the mouth.

The third plane is characterized by the paralysis of the intercostal muscles, which becomes complete at the lower border of the plane. Breathing becomes abdominal in character and may interfere with the surgery. The pupils change from cone normal to marked dilatation. The cornea becomes dry and hardens.

In the fourth stage respiration becomes shallow and the interval between breaths increases until respiratory failure occurs. The heart continues to beat for a few minutes so that necessary can take place if treatment is prompt—withdraw all anesthetic and commence artificial respiration. In this stage the pupils are widely dilated.

Open Ether

Preanesthesia. Atropine 1/100 gr. alone or in addition a barbiturate induction with open ether may take up to thirty minutes and is an uncomfortably experience for the patient. In hot climates (and the majority of a stage is often

lung, due to rapid absorption of the ether. For induction may be well-nigh impossible. For these reasons open ether is not recommended for induction. The method is described for those occasions when only ether is available.

Cover the mask with 6-8 thickness of gauze. Encourage the patient to breathe normally and wrap a deep bottle, deep ether can to the mask as quickly as the patient will tolerate the burning or concentration until 40-100 drops per minute are being administered. If the patient objects to the concentration by coughing, gagging, breath holding or unwilling to lift the mask and allow two breaths of fresh air, replace the mask and proceed at a slower rate. Once the patient is unconscious a gauze pad with a hole for nose and mouth may be placed below the mask to reduce leaks between the face and the mask.

When surgical anesthesia has been maintained for 30-45 minutes the dropping rate should be reduced to 40-50 per minute and thereafter be controlled by state of anesthesia.

Ideally for abdominal surgery the breathing should be automatic, pupils central, head and thorax moderate distention. Ensure a good airway either by turning head to one side after relaxation of the jaw and neck muscles has occurred or if this is insufficient, by use of an oropharyngeal airway and support of the jaw.

Theopontine

Theopontine is an excellent anesthetic for very short periods (5-10 minutes) or for the induction of anesthesia when inhalation anesthetics are to be used for maintenance. It can be used for longer periods but is not recommended unless the operator has had considerable experience in its use.

Theopontine should always be used as 21 per cent solution, i.e. 0.5-gramme in 20 ml. To mix the solution draw the required amount of water for injection into a syringe and then squirt it into the container holding the powder. Repeat two or three times until all the powder has dissolved.

A syringe with an aspirating needle and a fine bore needle with a short bevel make very convenient assets.

Method

Select a vein in the arm preferably one in the antecubital fossa or, if there on the lateral side away from the brachial artery. Place a tourniquet on the arm above the site for injection and clean arm with spirit. Insert the needle in the vein and withdraw a little blood to confirm its position. Release tourniquet and palpate over point of needle to exclude arterial pulsation. If in any doubt withdraw needle and start again. Inject 2-4 ml and pause to judge effect and to ask patient if he is comfortable. Should the needle be inadvertently the patient will complain of pain down the arm—allow the patient to volunteer this information, never ask about pain as a leading question—the needle is useless. If the patient is comfortable then proceed with the injection and anesthesia is induced—relaxation of arm, absence of eyelid reflex. Give a further 4-8 ml slowly. If the anesthesia is to be

maintained as *apnea* other than proceed as under open ether. The rough reflex is still present so that the ether is stopped on the mask as quickly as the patient will tolerate the concentration of vapour.

This is a plus-minus method of induction for the patient, and the required degree of anaesthesia should be reached in 10-15 minutes.

When thiopentone is used as the sole anaesthetic or for induction of anaesthesia and there are no means of actively cooling the lungs, there are a number of respiratory depressants such as morphine in the premedication. Give atropine 1-100 gr. alone or with a barbiturate such as amobarbital 3 gr.

If a central respiratory depressant is used it is essential to get a varying period of apnea following the injection of thiopentone.

Chloroform—Ether technique

If thiopentone is not available then a mixture of chloroform and ether can be used for induction. The mixture should be two parts chloroform and three parts ether and should be regarded as a weak chloroform.

Proceed as for open ether but use the mixture more sparingly—it is seldom necessary to use more than 40-50 drops per minute. Do not put a gumpot pad on the face and if possible feed about 50 ml. oxygen under the mask.

As soon as the third stage of anaesthesia is reached change to ether alone and proceed as for open ether. The gumpot pad can now be placed over the face in such a position.

Thiopentone, Nitrous Oxide and Oxygen, Fio₂

Premedication—Omnipon 1 gr., scopalamine 1/150 gr. One to one and a half hours before operation is a good premedication in the average case.

Analysis—Following 1 W. Thiopentone as described above supply 6 litres nitrous oxide and 2 litres oxygen per minute through the normal open circuit. Gradually open the tap on the ether bottle until it is fully on, then decrease the flow until the gases are bubbling through the ether. Proceed with the maintenance adjusting the amount of ether required by the signs of anaesthesia.

To prevent excessive cooling of the ether, and therefore loss of concentration of the ether vapour, a water jacket may be placed round the ether bottle. The temperature of the water should not exceed 50° C. and mixed in an amount equal to the boiling point of ether (35.5° C.).

It is of great benefit to add minimal tritone from two sources, before introducing ether until the gases are bubbling through the ether. Tritone is less irritant to the mucosa than ether and quickly dampens the pharyngeal reflexes.

The gas flow (nitrous oxide and oxygen) must not be allowed to drop below the minute volume of the patient, i.e. about 7 litres, otherwise there will be a build up of carbon dioxide. Of this flow oxygen should be at least 25 per cent to ensure a concentration of 20 per cent in the lungs.

To prevent rebreathing and a consequent build up in carbon dioxide concentrations in the gases breathed, the rebreath valve should be in the fully open position.

Thiopentone Sodium (Pent and Dipen, Trilene)

This is a very useful anesthetic when no relaxation is required (e.g. in lumboscopy).

Preparation.—Chloroform 1 gr., scopalamine 0.1/50 gr.

Following induction of anesthesia with thiopentone, give a flow of gases of nitrous oxide 8 litres and oxygen 2 litres per minute. Check lens air intake until it can just be detected by smell. Trilene is a good analgesic even in minimal concentrations and it should not be used in high concentrations. With the higher concentrations of nitrous suspension becomes rapid and shallow, followed by cardiac depression—the commonest being bradycardia and pulse lagging. Should the respiratory rate exceed 30 or a cardiac arrhythmia occur, trilene should be turned off and the nitrous oxide flow increased to 2 litres per minute. Trilene must never be used in a closed circuit because it reacts with soda lime to form dichloromethylene which causes central nerve failure.

General Anesthesia Combined with Local Anesthesia

In this technique a light general anesthesia is used and relaxation is obtained by the use of local anesthetic. For example, for an appendicectomy 40–50 ml. of 1 per cent. cyclocaine soaked gauze over the abdominal wall round the incision will give adequate relaxation. Local anesthetic used in this way enables the patient to be kept in a lighter plane of anesthesia and thus the total amount of ether used is reduced, and the patient's general condition is better after the operation.

Complications and Their Treatment During Anesthesia

Vomiting occurs in second stage only.

- (1) Remove mask and turn head to side.
- (2) Lower head of table.
- (3) Insert a Hare's gag well back on molars.
- (4) Suck the mouth thoroughly and use suction if available.
- (5) Replace mask and increase anesthesia as quickly as possible.

Respiratory Spasm

Stop at once to

- (1) The breathing apparatus at the induction. Remove mask, give two breaths of air, proceed with a low-irritating concentration of vapour.
- (2) Suspend vapours at too light a plane of anesthesia. Deepen anesthesia.
- (3) Regress from third to second stage of anesthesia. Deepen to third stage.

Respiratory spasm usually starts as a partial closure of glottis and the above remedies will usually suffice. However, if closure of glottis becomes complete:

Stop anesthetic until breathing is re-established.

Give oxygen under pressure if possible.

If means of giving oxygen under pressure are available (p-4) oxygen will 4-5 cc. scintill. I.V. Scintill will relax the spines and stimulate respiratory efforts for 4-5 minutes so that positive inflation of the lungs may be continued until automatic breathing resumes.

Trauma

Unusual always due to the base of the tongue encroaching on the oropharynx.

- (1) Turn head to side
- (2) Hold jaw forward
- (3) Insert oropharyngeal airway or
- (4) Insert nasopharyngeal airway

Apnea

May follow apnoea of thiopentone especially if a central depression has been used as premedication. Give oxygen and artificial respiration. With treatment the apnea usually passes off in a few minutes.

Cornea in use

Anesthetic eye may be caused by damage to the cornea by gross pungent anesthetic: ether other chloroform, blood gas or anesthetic (i.e. the anesthetic) repeatedly so prevents the eyes during the anesthetic. A drop of sterile mineral oil should be instilled into each eye at the end of an ether anesthetic. The oil will cleanse ether and so protect the eye. Never instill oil into the eye during the anesthetic or the vapour will be dissolved and cause irritation to the conjunctiva and cornea.

Bleed

May be due to too light a plane of anesthesia, loss of blood or body fluids.

- (1) Make sure the anesthesia is deep enough
- (2) Ensure a good unobstructed airway
- (3) Intensive care when may be required
- (4) If hemorrhage is trace I.V. dextrose may be used (blood must be taken first for cross match as dextrose interferes with this test)

John's Coma's

Occurs very rarely etiology unknown, only occur in deep ether anesthesia. Coma's start in muscles of the fins and spread rapidly to the body. After the eyes visible. Respiration ceases, cardiac action becomes feeble and person in condition quickly becomes critical.

Treatment

- (1) Stop anesthetic
- (2) Give O_2 under pressure if possible
- (3) Inject intracardially just enough thiopentone to control convulsions

Anatomical Disposition

When this occurs the patient feels severe burning pain along the arm and hand. There may or may not be blanching of the hand with a cross of the fingers.

Treatment

Stop injection but leave needle in as a ligect. 5 ml. 2 per cent procaine or 80 ml. 1 per cent procaine then with the needle.

Wrap both arms in cotton-wool and bandage to prevent heat loss.

Continue with the emergency operation.

Do a brachial plexus block to paralyze the vasomotor sympathetic fibers.

Three hours after operation or as soon as possible after this period start antivenereal therapy.

Refresher Course in Gasolators

Refresher courses in gasolators of two weeks duration are given in the Naval hospitals. Application for these courses should be made to the Medical Officer in Charge.

Pharmacology.—This can be only briefly reviewed before the clinical application of the steroid is described. The relationship to the normal hormone is of obvious importance. Despite its chemical structure it appears to be devoid of endocrine activity, as demonstrated by the studies of Gardner *et al.* (1956). In man, no significant alterations in electrolyte balance occur in the blood or urine following its administration (Lishors *et al.* 1955) while the effect on the blood sugar was negligible (Taylor and Steiner 1956; Pflieger 1957).

The effects upon the cardiovascular and respiratory systems in cats and dogs have been studied by Pan *et al.* (1955) and Das and Azouz (1957). No major alterations of respiratory rate and volume or heart-rate and rhythm, were produced by injection of doses within average anesthetic limits. Transient falls in blood pressure were noted during the injection. But hydrocortisone was much less potent than thiopentone in this respect. Similarly, Taylor and Steiner (1956) found that following the administration of hydrocortisone, the isolated rabbit heart showed only one-third of the depression attributable to thiopentone.

Pan *et al.* (1955) also studied the effects of giving the steroid to dogs over a two-week period. No histological, biochemical or hematological abnormalities resulted.

Lishors *et al.* (1955) studied the effects on the autonomic nervous system, and concluded that there was no major effect on this system in dogs. Taylor and Steiner (1956) found no effects of significance on autonomic pupils in man. Concerning the central nervous system, it has been found that a only symptoms of short duration, with little post anesthetic depression is produced in humans. Pan *et al.* (1955) again observed that hydrocortisone was much less toxic than thiopentone, while its therapeutic index was found to be two or three times greater than that of the thiobarbiturates. In man electroencephalographic studies have shown that the steroid and intravenous barbiturates produce very similar effects on the central nervous system (Bellville, Harward and Boyan 1956), and Gardner *et al.* found that changes in cerebral blood flow, oxygen uptake and glucose utilization were of the same order as those produced by barbiturates. Biochemical studies, however, do point to a marked difference between the steroid and thiopentone, for while the action of thiobarbiturates is probably achieved through a reduction of cytochrome oxidase activity the use of action of the steroid upon the "main line of biological oxidation" is different and is thought to be at the dehydrogenase level (Gardner and Elliot, 1947; Hayano *et al.* 1959).

In concluding this review of the pharmacology, it should be mentioned that hydrocortisone appears to be contraindicated in the liver (Gulley and Tomkins, 1956) and excreted through the kidneys (Gardner *et al.*, 1956).

On the basis of such considerations, it appeared reasonable to use the steroid as a local anesthetic in clinical practice. It then became possible to eliminate some of its effects in man, and to attempt to produce its, produce its anesthetic

HYPERVENTILATION as a Serial Anesthetic

Technique of Administration

5 per cent, 10 per cent and in the case of a 6-year-old, 2.5 per cent, solutions were used. Physiological saline at room temperature was the solvent. The technique of injection was based on that suggested by Beckford (1957) and elaborated by Gaffey and Lerman (1958). Premox was injected rapidly through a large-bore needle into a vein in the antecubital fossa; the injection taking 20 seconds or less. It was followed by 5 ml of either ether or 1 per cent procaine which acted to flush the drug along the vein. In a further attempt to ensure the drug flows the vein the patient was asked to open and close his fist while the anesthetist elevated the arm and massaged the antecubital fossa and upper arm towards the shoulder for about 20 seconds. This new technique of injecting a strong solution directly into a vein rapidly, appears to have virtually eliminated the development of thrombophlebitis, which was often the result of the earlier technique of using an intravenous infusion; the procedure naturally taking longer.

In all cases only one dose was given. Dosage was calculated according to body weight, the schedule of 8 to 8 mg/lb for the average patient being used, as recommended by Lander (1954). Premedication was with atropine 1 gr. neopentolamine 1/120 gr. except in the case of a 4-year-old boy who received an appropriate dose of these drugs.

20 patients were included in this series. Their ages ranged from 4 to 44 years, the 4-year-old being the only non-adult; all were males except one 32-year-old woman, and all were British except for one Indian Chinese male. Physically none could be regarded as particularly stout. The operations are summarized below (see table) together with a table of the dosage of premox and adjuncts.

Description of Anesthesia

Following the injection the patient becomes increasingly drowsy. Sleep eventually falls within 5 minutes, induction being characterized by the patient's onset of sleep. During this period there are no major alterations in the respiratory and cardiovascular functions; the skin is warm and pink, and the jaw muscles become relaxed. Immediately after the patient has fallen asleep there is sufficient analgesia to allow a Guedé needle to be inserted. The early stage of anesthesia is also characterized by depression of the pharyngeal and laryngeal muscles, so much so that laryngoscopy and intubation can often be performed without prior administration of a relaxant. In the present series, intubation was carried out under the influence of premox alone in 4 cases; in a further 7 small doses only of relaxants were given in addition before intubation was attempted. Depression of these reflexes is not complete and intubation is sometimes accompanied by coughing or bucking, though never prolonged, and the vocal cords widely separated retain their mobility.

After intubation, the reactions of an artery, arterial oxide and oxygen

are added. During the subsequent course of anesthesia, supplements of infuse petroleum and relaxants are given as required, but a notable reduction of the dosage of relaxants is compared with the amount required during the commonly employed thiopentone-relaxant-analgesic sequence in a definite and advantageous finding. Sometimes there is also a reduced need for petroleum. Thus procaine can replace thiopentone and further the second appears to have both relaxant and analgesic properties. Murphy *et al.* (1953) believe that hydroxytoluene "is a true anesthetic agent as evidenced by its ability to control pain, obtund reflexes, produce relaxation and produce sleep, all without depression of vital functions." Another advantage, especially in abdominal and thoracic work, is the ease with which respiration can be controlled, using only small doses of relaxant in adjustment.

Intercourse of Respiration and Circulation

(i) *Respiration*—No apnoeic or gas rashers were made, but no obvious major alterations in respiratory rate or volume were detected. There was a tendency for respiration to slow slightly, after the apnoea, the rate returning to normal soon or commencing at between 10 and 15 per minute. Respiration never ceased again, in absolute contrast to thiopentone.

Reyn-Smidt (1950) analysed the respiratory changes with a dry gas meter. He found that within 5 minutes of the apnoea there was an average fall in tidal volume of about 150 c.c. in the next 5 minutes a further slight fall might occur, but thereafter little change was detected until respiratory exchange initiated as a result of pain or lightning anaesthesia.

(a) *Circulation*—In this series there were no major alterations of pulse rate or rhythm. This is in accord with the general experience of procaine. Some workers believe that a moderate tachycardia is attributable to this drug (Hjorthoe 1957; Landon 1958). Of the present case a pulse-rate exceeding 100 per minute was noted in 2, in only 2 did it exceed 120 per minute. Of these latter one patient had a rate of between 100 and 115 throughout the apnoea; this was for the removal of an acutely inflamed appendix. Succinyl being used as the relaxant, the other was a nervous individual who had a transient tachycardia of 140 per minute following tracheal and pharyngeal packing.

Blood pressure changes were also minimal. A fall of up to 15 mm Hg. systolic pressure was a common, but not consistent, finding after the apnoea of procaine. Therefore there was often no further reduction and there was often a slight rise. No cases of hypotension occurred (the criterion being a systolic pressure of 80 mm Hg. or less). The difference in pressure (systolic) concentrations did not appear to be significant. These blood pressure changes appear to be of the same order as those reported in the literature, the hypotension which has sometimes been observed is short intense, and is easily corrected by vasopressors.

Post-operative Course

Return to consciousness after the apnoea took a variable period, when

intubation had lasted for 30 minutes or more, it was a sensation which, in other cases, it varied from 15 minutes to one hour. The general condition of patients in the post-operative period was satisfactory, three days would be an unusually short time. Complications were few. One case of thrombotic embolism occurred following the accidental retrograde injection of a total of 4.5 ml. (50 per cent.) procaine, no cases of thrombophlebitis were seen although there were 5 instances of plaster discharges of the vein and the injection, working occurred in 3 cases (1 being the child who had removed either a tubedrag but in some was a screw and there was 1 case of pulmonary collapse following an appendectomy. In this series the study of anaesthesia appeared the more hazy.

Discussion

Gulley and Korman (1956) point out that the introduction of this steroid marked the first departure from the use of the barbiturate and thiobarbiturate and derivatives since intravenous anaesthesia became established in 1901. This alone is of interest, and its relationship to numerous physiological substances certainly merits discussion. Gordon *et al.* (1955), in their study of the cerebral metabolic effects of steroid anaesthetics, reviewed the increasing knowledge of the effects of hormones on the central nervous system. From the anaesthetist's viewpoint, the physiological "locking" action of steroids on cerebral metabolism certainly has some theoretical advantage over the pharmacological action of the barbiturates. Another point of interest lies in the issue of not-being in the post-operative period (Gulley and Korman, 1956; Lerman, 1956) the former authors likening it to the euphoria of conscious therapy. Those who also point to increasing suggestions attributable to H. Kohn, concerning the mechanism of normal sleep "as an yet, undisturbed sleep is secured during the stress and fatigue associated with surgical activity which builds up to a sufficiently high concentration to suppress the muscle-activating centre which, in turn, can no longer activate the cortex, so that sleep occurs".

If that is a very precise is certainly an effective anaesthetic agent. Such is an efficiency that Bryco-Smith (1955) believes it to be indicated for induction of anaesthesia in chronic alcoholic cerebellar resistant cases. Premature is usually compared with theophrastus. With pressure, a practical and convenient form of anaesthesia is permitted so that an alternative intra-venous anaesthetic is available. The steroid has certain advantages, was noticed by Gulley and Korman (1956) a high therapeutic index, lack of respiratory depression, quiescence of pharyngeal laryngeal and bronchial reflexes, the ease with which controlled respiration can be effected, and a less unpleasant recovery period for the patient. To these might be added the reduced need for relaxant drugs, which today are accepted as being not without risk. The slow induction is also recognized as an advantage in post-operative cases (Lerman, 1956; Gulley and Korman, 1956) since myocardial collapse and nervous do not occur with the injection of procaine, as is common

with the similar use of thiopentone. Pressure, therefore, can be regarded as a preferable alternative, in some cases. Reversing the literature it has been indicated in particular for laryngoscopy and bronchoscopy, laryngitis and thyroid surgery, obstetric surgery including Caesarian section, cases of respiratory insufficiency, diabetes mellitus, and geriatric cases.

The introduction of pressure has largely removed the disadvantages of the earlier method of stirred anesthesia when hypotension was given as a weak solution by intravenous drip. Colley and Lerman (1959) described these: the slow rate of induction resulting from the administration by intravenous drip; the marked tendency to thrombophlebitis; when very weak solutions were used; and then in pulmonary and occasional falls in blood pressure especially in elderly patients. Of these thrombophlebitis is now the main disadvantage of the method due to its wetted properties. However, the work of Macfarland (1957) and Colley and Lerman (1959) has shown that even this is minimal if a careful technique is used. With carefully graduated doses, there is now a greater control of anaesthesia and especially in elderly patients cardiovascular changes are less marked than with the earlier method of stirred anaesthesia.

Whether this anaesthetic agent will replace the well-used chloroform/ether is doubtful in any rate in the near future. Opelke (1957) contended that the delay in onset of action, the need for a dosage schedule, and the occasional prolonged post-anaesthetic sleep would induce many anaesthetists to continue using established techniques. Certainly pressure could not be used for the crash induction techniques favoured by many in cases of acute myocardial obstruction and emergency Caesarian section.

However, the introduction of stirred anaesthesia does seem to be an enrichment of anaesthetic techniques. Whatever the latest progress of stirred anaesthesia, it is in the meantime waiting to witness one more phase of medical progress, which for the anaesthetist is obviously directed towards the better fulfillment of his first duty towards the patient: "To ensure anaesthesia."

SUMMARY

The use of the stirred anaesthetic, pressure, is described in a series of 26 patients in a civil hospital. The pharmacology is reviewed and an attempt is made to evaluate the position of this anaesthesia today.

ACKNOWLEDGMENTS

I am indebted to Surgeon Captain L. G. Yeardall, R.N., Medical Officer-in-Charge, Royal Naval Hospital, Hong Kong, for permission to publish this study.

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CLINICAL TRIAL IN PEPTIC ULCERATION OF "STELARD" A COMBINATION OF TRIFLUOPERAZINE (STELAZINE) AND ISOPROPANOLIDE IODINE (TYRIMID)

BY

Surgeon Commander L. B. ARDEN, R.N.

The treatment of cases of peptic ulcer in the Service can be a difficult and frustrating experience. Under certain conditions the stresses and strains of Service life may be overwhelming and it is not surprising that peptic ulcers are a relatively common finding among young personnel. Even in peacetime many of the younger individuals may find themselves more especially when doing compulsory service exposed to an environment which is to them difficult and strange. There is no doubt that in certain susceptible individuals environmental changes readily produce gastro-intestinal complaints and moreover induce the appearance of peptic ulcers. Treatment cannot be directed entirely against possible causation, although it is recognized that in many instances discharge from the Service may lead or result in ulcer. As a consequence a systematic procedure is needed to deal with cases of peptic ulcer if more be won than to consider the effect of the environment on the patient and either to alter the environment or to build up the resistance of the patient so that he may withstand what might appear to him to be an unpleasant environment. The role of the tranquillizers thus assumes a degree of importance.

There have been several publications on the value of Trifluoperazine (Stelazine) as an effective tranquillizer in the treatment of psychotic and psychoneurotic conditions (1, 2, 3, 4). The place of the symtomal analgesic isopropanolide iodide (Tyrinid) in the treatment of gastric and duodenal complaints is already established in clinical practice (5, 6, 7). A trial of a combination of treatment with these two drugs was therefore carried out at the Royal Naval Hospital, Haslar. Stelated¹ combining both drugs in a single tablet contains 5 mg. "Tyrinid" and 1 mg. "Stelazine". Both these drugs are relatively long acting each in its own right and it was considered that a total daily dose of 15 mg. "Tyrinid" and 2 mg. "Stelazine" could be considered adequate for treatment in addition to the influence of analgesic and control of the diet. A total of 27 naval personnel suffering from peptic ulceration were treated over a period of four weeks each with "Stelated" and the results are presented in this review.

MATERIAL

Choice of Patients

27 patients were selected at random from nasal ratings, sigmoidoscopy, endoscopy and treatment at the Royal Naval Hospital, Haslem. All patients had had the diagnosis established by radiology. 24 patients had duodenal ulcers, 3 had 'spary' duodenal ulcers where the diagnosis could not be definitely established, and 1 had a pyloric ulcer.

It was not possible to prevent ancillary treatment being given at the same time as 'Sedabal' and most of the patients took antacids in the form of magnesium trisilicate three times a day. A few patients were given placebo barbitone for the purpose of additional sedation, and in most instances, a modified peptic ulcer diet was prescribed.

Patients were treated for four weeks with 1 tablet of 'Sedabal' twice a day and, where possible, were hospitalised once more at a follow-up. At the first assessment, special record cards were completed and notes made on the general condition of the patients with the previous history, present treatment and the symptoms. At weekly intervals and at the follow-up, as on the first occasion, notes were made on the presence of nausea, vomiting, abdominal pain, discomfort or tenderness, bowel action, weight, appetite, headache and appearance of the tongue. It was possible thus, to have a record of the main symptoms and signs throughout the course of treatment. The patients were not informed of the nature of the tablets and no special importance was claimed for the method of treatment. The results were established by clinical impression compared to previous therapy where a tranquilliser drug had not been incorporated in the treatment.

RESULTS

27 patients were investigated and Table 2 presents the results obtained. In almost every case, treatment was continued for four weeks and a final assessment was then made. There was no long term follow-up of the symptoms and signs but in several cases radiological findings were available where barium meal examinations were subsequently carried out.

The results are recorded as 'very good', 'Good', 'fair' and 'no change'. In the 'very good' results the patients became symptom free and were discharged from hospital supervision; there were 12 in this group. There were 8 patients recorded as having 'good' results. In these patients all the symptoms had cleared up except for an occasional complaint of mild indigestion and abdominal discomfort.

5 patients were recorded as having a 'fair' response and these continued to complain of some pain and abdominal tenderness. One patient was not affected by treatment and his condition remained virtually unchanged. The X-rays of 15 patients were available for comparison with their previous results. In 13 patients the ulcers were no longer demonstrable, in 2 patients the ulcers had become smaller and more difficult to define, 12 patients were not X-rayed after the period of treatment. Nausea and vomiting symptoms,

Classical Travel in the new "Literatures of" Scotland

TABLE 1.—The Effects of the American vs. British Model

No.	Duration of complete case		Total time of case	By mode		
	Age Per	Per		Normal	Fast	Slow motion
1	20	14				
2	20	3 1/2				
3	23	8				
4	23	8 1/2				
5	26	10 1/2				
6	27	4 1/2				
7	34	8				
8	37	1 1/2				
9	37	1				
10	37	1 1/2				
11	40	2				
12	44	1 1/2				
13	45	8				
14	47	1				
15	48	7 1/2				
16	54	1 1/2				
17	54	1 1/2				
18	54	1 1/2				
19	54	7 1/2				
20	55	1 1/2				
21	55	1 1/2				
22	57	1				
23	57	1 1/2				
24	57	8				
25	58	9 1/2				
26	58	1 1/2				
27	57	1				

which were to appear more commonly in younger subjects, cleared up rapidly in most of the patients. Abdominal discomfort and pain was usually rapidly relieved within fourteen days of treatment. Appetite was not greatly affected but while it was it rapidly returned to normal. No side-effects attributable to treatment were observed.

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The results of treatment in disorders where are notoriously difficult to interpret and in Norway personnel, where there are often additional difficulties, the results are correspondingly more difficult to assess. So although it is not prepared to draw too many conclusions from this investigation it is one-sided to be of value to give a clinical impression obtained from this form of trial. In this series of 27 patients suffering from gastric ulcers the results could in many instances be compared to previous treatment with other preparations under similar conditions over a similar length of time.

If you are not able to find relevant research, you may need to consider other sources.

in the first group, and decreased in the second group compared with 1 hour unchanged. These results indicate a combination of an increase in the rate of a potent anticholinergic drug alone (under similar conditions, drugs are known to have produced no good results in this) is counterbalanced by the addition of a transpiling agent such as Tyrosine. This not only increased the recovery rate but also had a beneficial effect on the mental aspects of the patients treated. It is questionable whether 2 mg. of Tyrosine is the ideal dose in this combination given over twenty-four hours. It is always a disadvantage in a series of cases such as this not to be able to alter the dose of the individual components of the mixture given. There is sufficient evidence to show that Tyrosine is a valuable long-acting preparation and in doses of 3 mg. b.i.d. is an adequate form of therapy for cases of peptic ulcer. Although Tyrosine is in itself a long-acting transpiler it is possible that an increased amount might be needed to control a psychomotor background (May 1959).

Although only 27 patients form the basis of this investigation, there is sufficient evidence as relates to previous experience to show that "Reliefed" may be a more favourable method of treatment than by giving an anticholinergic drug alone. In certain cases, the transpiling effect was obvious and must certainly have had a place in supplementing the pharmacology.

SUMMARY

(1) "Reliefed" is a combination of a synthetic anticholinergic, "Tyrosine" and Tyrosine, a transpiler, has been used for the treatment of 27 cases of peptic ulcer.

(2) The response to therapy after a period of four weeks treatment showed very good, 13 "good", 8 "fair", 5, and "no change".

(3) Radiological observations on the ulcers showed that in 15 patients who were X-rayed, both before and after treatment, radiological cure was observed in 12 and improvement in 2.

(4) It is suggested that "Reliefed" is a useful preparation for the treatment of peptic ulcers together with antacid therapy and a suitable dietary regime.

ACKNOWLEDGMENTS

I am grateful to the Medical Officer in Charge, Royal Naval Hospital Haslem, for permission to record these findings, and to Smith, Kline and French Laboratories Limited for supply of the drug employed.

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Clinical Notes and Cases

AN UNUSUAL INJURY OF THE LARYNX

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Nagasaki Commandry G. S. IRVINE, R.N.

E. W. M., a Petty Officer aged 33 years, was admitted to the Royal Naval Hospital, Haslar.

History.—The casual history was that he had been stopped on the deck, while using his hands, and that he felt that a piece of metal went against his neck on the roof of his mouth behind his nose. The fact occurred the previous day. Further questioning revealed that whilst using a piece of metal he was momentarily landed on the back by someone passing behind him. The hand was forward and the head of the fish struck the table leaving the back with his inside.

His legs were usually at an out posture at 11 a.m. when a large vapour-bagged swelling on the left side was noted. There was no swelling whatever on the right side. The extent of the swelling was not then clear and admission to hospital for observation was accordingly advised.

When seen on admission at about 3 p.m. there was some swelling on the uppermost region on the right side which had not been present previously. There was no voice change or dyspnoea, but he had some severe dysphagia for solids. The nasal region was irregular and some fluctuation existed. His arm on the right side, in the post axilla space. No other evidence of any other foreign body was seen.

He was treated with hot wet inhalations of steam between 10 a.m. and 12 noon.

By next morning, i.e., twenty hours after the accident, the left neck more indurated and his dysphagia was very noticeable. On examination the swelling was seen to be principally upper laryngeal, lying on the region of both arytenoids and the right aryepiglottic fold. Both vocal cords were entirely normal and moved normally. The swelling had decreased considerably over the previous day. There was a patch of fresh fibrin on the posterior surface of the aryepiglottic folds. It was concluded that the swelling must have been produced in some manner by the fish digging into the posterior surface of the expanded epiglottis—the insertion of the fish would have done a laryngeal exploration. He was operated through.

On the following day the swelling had again increased and his discomfort and dysphagia were more marked. It was considered that the swelling would continue to subside and should have no sequel doubtless. He was discharged on full duty next day, i.e., twenty-two hours after the injury.

COMMENT

No record of any similar case has been found in the literature. Koch (1884) records a case of laryngeal injury caused by the bite of a ray fish pressing it from the external surface of the neck.

SYMPTOMATOLOGY

Mr. Smith, age 42, is American, East African, G. Philip, Q.M.S. 1st, postmaster (1) at this station, second.

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THE USE OF VARIDASE IN ORAL SURGERY

BY

Surgeon Commander (R) E. B. MACKENZIE, R.N.

After any surgical operation there is immediate bleeding from the blood vessels involved, and the extravasated blood in the intercellular spaces attracts serum, as it does a wound surface in contact with the adjacent tissues. Oral surgery frequently involves bone as well as the soft tissues, and is often required at sites where open injury is sustained. The resultant manipulation and surgery in these inaccessible regions results in considerable trauma which over stimulates the subsequent inflammatory response. Stasis of blood and lymph causes a result of retarded circulation, the process of healing is impeded, and conditions favourable to bacterial growth prevail [1].

A reversal of this process of inflammation and edema is attained by the administration of Streptokinase. Although the mechanism by which it acts is not known, it is assumed that a proenzyme in the blood or saliva reacts with Streptokinase to produce an activator which catalyses the plasminogen in the saliva or blood, and converts it into plasmin. It is the plasmin which produces a lysis of the fibrin clot in the local vascular and lymphatic systems, and at the same time, reduces the viscosity of the edema. These two factors increase the resorption of fluid by improving the local circulation. The improvement will also permit the passage of bacteria from the site of injury to the rest of the body, but it will at the same time, allow antiseptical drugs to reach any source of infection in much greater concentrations [2].

The intramuscular injection of Streptokinase prior to the surgical removal of teeth has been found to be reasonably effective, although it may be responsible for pain and tenderness at the injection site and a rise in temperature

In some cases, erythematous sub-effects appeared and one patient exhibited the symptoms of a *Staphylococcus* spread of infection [3].

Streptolacine, in the form of Vardine tablets penetrates the oral mucosa and subsequently enters the circulation, and, by the method of oral adhesion, causes the drug to be introduced to the site of inflammation. It is dissolved by the gastric juice, but before it is absorbed the abundance of salivary phagocytes is ample for the Streptolacine phenomenon, necessary to take place [4]. It is claimed that the bleeding and clotting times are unaffected by Vardine, and that the prothrombin index is unaffected.

In the series of cases reported in this paper, patients were chosen who had uncracked third molar teeth which by X-ray evidence appeared to be soundly impacted on each side of the jaw. Following the removal of each tooth by normal surgical procedure, a reaction of excessive edema, pain and trauma, was to be expected. Before operation the clothing was and when blood cell count of each patient was undertaken. As control, the removal of the teeth on the side which appeared from the radiographs to be the easier—superior position and which proved to be so in practice—was completed under normal surgical conditions and with penicillin cover, but without the administration of Streptolacine.

A few days later the teeth on the opposite side were extracted using similar methods of surgery, penicillin cover and antibiotics, but with the addition of Vardine therapy. Both tablets were given in all. One tablet of Vardine (30,000 units of Streptolacine) was allowed to dissolve in the buccal sulcus at 1000 and 2000 on the day before the removal of the teeth. The operations were carried out at 0915, and on that day the patient was given a tablet at 0700, 1300, 1600 and 2000 and in addition at 0800 and 1700 on the day following. The patient was told not to swallow saliva for at least five minutes after placing the tablet in the buccal fold.

RESULTS

Pre-operative X-rays and post-operative photographs of these typical cases are shown in fig. 1 to fig. 7.



FIG. 1. Case 10. Streptolacine salivary gel. The infection of 10 is completely resolved, there is no swelling of 11.



Fig. 1. Patient 1. Head tilted backward, eyes closed. (See text for details.)



Fig. 2. Patient 1. Head tilted to right, eyes closed. (See text for details.)



FIG. 1. (a) (b) —Pre-operative, endoscopic photographs



FIG. 2. (a) (b) —Photograph of a patient with a large, dark, irregular lesion on the right side of the face, extending from the cheek down to the chin.



Fig. 6 (Case 4b) — 100% face score following removal of $\frac{1}{2}$ with Random. The resulting is still without a bias.



Fig. 7 (Case C) — Face obscured in (a) and (c). (b) is partly obscured.



For $\beta \in \mathbb{R}$, let \mathcal{H}_β denote the Hilbert space of functions f on \mathbb{R}^d with norm



1. $\frac{1}{2} \log \frac{1}{2}$ 2. $\frac{1}{2} \log \frac{1}{2}$ 3. $\frac{1}{2} \log \frac{1}{2}$ 4. $\frac{1}{2} \log \frac{1}{2}$ 5. $\frac{1}{2} \log \frac{1}{2}$ 6. $\frac{1}{2} \log \frac{1}{2}$ 7. $\frac{1}{2} \log \frac{1}{2}$ 8. $\frac{1}{2} \log \frac{1}{2}$ 9. $\frac{1}{2} \log \frac{1}{2}$ 10. $\frac{1}{2} \log \frac{1}{2}$

CONCLUSIONS

The results obtained in these cases support the view that amyl (amylase) suspension is a useful and effective drug. It is an expensive product, but used for high cost may outweigh against its routine use.

ACKNOWLEDGMENT

I have the permission of the Medical Officer-in-Charge R.N. Hospital, Portland, Surgeon Rear Admiral W. R. S. Pennington M.B.C.S., L.R.C.P., Q.H.P. to publish these notes.

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FURCATING HYPERPLASIA OF THE DENTAL PULP "PINK SPOT"

BY

Surgeon Commander (24 F. S.) MARSHALL, R.N.

There is a comparatively rare condition when the hard tissues of an individual tooth are resorbed apically and replaced by pulp tissue which remains vital. The prolapsing pulp eventually penetrates through the enamel usually at the gum margin. Colossation of the tooth due to the underlying pulp showing through the distal cut enamel is observed, a sign which is usually present, led to the diagnostic description of "Pink Spot" being applied to the condition.

The crown of the tooth may become exposed so extensively that a slight force may sever it from the root. Painful symptoms are absent.

CASE REPORT

A naval Party Officer, aged 26, reported that he had recently lost a small tooth behind one of his front teeth. There was no pain, but he occasionally noticed an unpleasant taste from it.

One of his central incisors was slightly darker at the gum margin than the adjoining teeth (Fig. 1).



Fig. 1.—Dorsal aspect showing slight enlargement of lymph nodes with facial nerve and associated vessels.

There was a small hole, the size of a pin head, in the posterolateral position of the head around the angle showed a pinkish tinge (Fig. 2).



Fig. 2.—Posterior view with description and position of cow's (1) jaw warts.

A probe could be passed easily, and a short pin deep over the hole, and pulp could be felt, the posterior teeth, however, were. Radiographs showed that a large part of the tooth crown and denture to the base of the crown, and top of the root had been destroyed (Fig. 3).

It would be expected that some increase in body mass would lead to the early and complete healing of the tooth. The upper portion of the tooth and its surrounding bone appeared to be normal. A gross oral diagnosis, which was confirmed during the subsequent treatment of the root of perforating ingrowth of the pulp in a tooth.

Periapical Abscess.—The pulp was removed following a pin, which, in the case of a tooth, did not cause any harm, but the pulp was not cut off any damage, as it was made at the time that the tooth was very loose under the crown. A Pin was in the lip, and returned to the affected tooth could not be seen.

Extraction.—The perforation in the periodontal was enlarged and the maxillary pulp was of the crown and exposed portion of the root was removed. The distal part of the crown in the root had been destroyed and crown was being removed and by the lateral and basal enamel walls of the tooth crown. Possibly there was a line of enamel beneath the crown margin and the crown being retained from the pulp chamber was in contact with the periodontal membrane.

The maxillary crown could not pass and there was no evidence of signs. A temporary dressing was placed and a few days later the apical portion of the pulp was removed under local anesthesia and the root was filled. A gold placed over the apex, at the distal root for extensive irregular placement was removed and the crown was in contact with the root and the crown filling was done straight to replace the

instead of being exposed, now have become larger and gradually involved the entire root. Eventually, in the presence of a substantial lesion within the tooth apparently combined with resorption of the dentine from the inside, outwardly, in a photograph a sharply defined defect is seen inside the tooth which may or may not appear to connect with the dentine of the periodontal membrane.

There is often a difference between two types of resorption: internal and external or peripheral.

In central resorption the lesion starts in the pulp and it is called an endodontic lesion. Serial sections of such cases show that a perforation exists in the side of the root which communicates with the periodontal membrane.

In cases of peripheral resorption, the lesion begins invariably in the root outside. If there is no accessory canal, the pulp may become involved but in many instances the process is limited to the hard tissues of the tooth and the pulp remains intact. It explains the histopathology of the two types as follows. In the internal type of resorption there may be a widening of the root canal, the pulp tissue is transferred into vascular granulation tissue and the blood vessels proliferate, and extend into channels of resorption, penetrating deep into the dentine. These channels of resorption show the effects of marked osteoclastic activity; the cavity thus formed leads ultimately to fracture of the tooth.

There is apparently no difference between the way in which bone dentine connection is resorbed and it is therefore unnecessary to differentiate the giant cells associated with tooth resorption as either osteoclasts or osteoclasts. They are termed osteoclasts (Howe 1949).

CONCLUSION

A case of perforating hyperplasia of the dental pulp is described. It appears to have been caused by trauma occurring some twenty years previously. Treatment was carried out which would seem likely to be successful so long as the resorption was of enamel origin because the use of surgery, the pulp was eliminated by the method.

In cases where the process is of peripheral origin (external progression by periodontal means) and characterized radiographically by lack of evidence of the widening of the pulp canal, there would be more objection to a similar method of treatment as the resorptive process might continue or recur after period of quiescence.

ACKNOWLEDGEMENTS

I am grateful to the Medical Director-General of the Navy, Surgeon Vice-Admiral Sir Cyril Mox, KBE, CBE, MC, FRCS, QHS, for permission to publish this case and my thanks too also due to Instructor Lieutenant-Commander G. A. Bridges and Medical Assistant Dental Officer D. T. Green who produced the photographs.

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AN UNUSUAL CASE OF PRIMARY BENIGN STRICTURE OF THE COMMON BILE DUCT OF UNKNOWN AETIOLOGY

99

Sergeant Lieutenant K. T. HOSKETH, R.N.

TWO married women, an English gentleman employed as a school master who had attended hospital in August 1959 at the age of 29 years with an attack of acute appendicitis for which a standard appendicectomy was done and from which he made an uneventful return to good health.

In July, 1952 he was seized in turn by two symptoms for a non-specific illness characterized by abdominal cramps and bleeding diarrhoea which lasted three weeks each, lasting without apparent cause.

He was seized again in May, 1955 with a history of dyspepsia, vague abdominal pain, diarrhoea and increasing weakness for the previous three and a half months. There were no known past or present ulcers, no vaginitis, no transfusions and no past or present illness.

At that time he was young, 5-6 pale, lean, bloodless, each day was losing more weight. He was hungry, weight and his appetite was depressed and when eaten no change. The diet was just palatable. Serum bilirubin 5.0 mg. per cent, alkaline phosphatase 11 K. S. units, thyroxine 1.0 μ , urea nitrogen 7 mmol, and serum aspartate 100 units, erythrocytes 44 per cent, Hb 6.7, 10,000 per cubic centimetre, leucocytes 10,000.

He was operated upon in May, 1957 when a dilated but otherwise normal gall bladder was found with no stones. There was a stricture of the common bile duct below the level of the papilla with the probe that which was small, short and narrowed.

A cholecystocholecystostomy was performed above the level of the stricture followed by a cholecystocholecystostomy, no personal history of papercut such as stricture of the duct of the bile. A biopsy of the common duct stricture, was taken.

Following these procedures the patient recovered well with complete relief of his symptoms.

In February, 1958 he reported two further attacks which were presumed to be mild cholecystitis. He followed that in May, 1958 with a third series of symptoms accompanied by jaundice which subsided spontaneously in the following six or seven weeks months by increasingly frequent and debilitating attacks of cholecystitis.

Three years later, history could be reconstructed in June 1957 to discover a stricture of the cholecystocholecystostomy with a solitary calculus in the gall bladder. The stone was removed and replaced.

100 percent ethanol and with the use of a rotary evaporator, the oil is present in a liquid form. This is a viscous, light yellow liquid. It has a strong and well noted light petroleum odor. Freezing point is below -10°C . and the specific gravity is 0.850 at 20°C . (20/20).

Agave's rostrum is more undulating on the average (Fig. 11) and, as the gall bladder was dissected and described, protruding on opposite sides (Fig. 12). While 100% of the gall bladder was separated from the distended proximal portion of the intestine due to stress, the previous assumption that the gall bladder was thought to be no longer useful and was removed. The distal end of the intestine, gall, duct was also caught by stretching and opening the dissection. A lateral view placed proximally in the gall and showed the length of the organ is always in the only 15 cm. approximately. The apices of the intestine, was most affected proximally by the proximal and distal portions of the intestine due to stretching of the small intestine and abdominal translocation, observed, even in Labe, Togo.

Post-operative chloride balance showed a good flow into the distal tubule. It is a marked fall in water and the pump made an unsuccessful recovery and egress of sodium.

Since that time, he has shown steady improvement in his general condition and in his level of full-time employment for some months. The current Colorado, level 100, contract is renewed and is more difficult to negotiate. The oil-price phenomenon has decreased his ability to move quickly and so it has not been possible to move him to lower levels as was hoped.

1. *Journal of Management Studies*, 1997, 34, 1, 1-14.

This case appears to be a rare example of a benign structure of the common bile duct of unknown relevance.

The biopsy of the stomach shows chronic inflammatory tissue with some opportunistic metaplasia of the lining of the stomach duct. Such metaplasia is seen in the rheumatoid-inflamed gallbladder, indeed it was found in the gall-bladder later removed from this patient, but this is not known to occur with any frequency in the common bile duct although one must acknowledge that rheumatoid-like tissue can not often be obtained to histological scrutiny.

Warren Cole (1984) surveyed the strategy of non-independent contractors of the common hole drill: a high percentage of cases referred to him being the result of customer requests.

11. Overview

- (a) Exposed (thought to be *exposed*)
 - (b) Lipase (usually with blocking vessel)
 - (c) Cystic duct (not too close)
 - (d) During gastroscopy
- (2) Inflammation (obstruction challenge) (c)
- (a) Related to challenge
 - (b) Abscess (reflexion of bile about duct)
 - (c) *Pylophilus*
- (3) Secondary or preexistent (usually dental segment)
- (4) Obstruction due to malrotation

To this could be added such rare cases as previous foreign bodies and closed injuries (Jard, 1956).

The absence of any previous operations in the region of the binary itself, however, narrows the field considerably and all the other causes cited may be

evaluated with the possible exception of a salivary, which stone passed prior to onset of the original attack of pancreatitis.

It is possible that the nine-week illness from which this patient suffered in 1952 might have been a repeated stone, and a similar granulomatous affection of the common duct to form a fibrous structure cannot be excluded. No granulomatous structure of the small intestine was found at operation and in the absence of positive evidence it would be unprofitable to make even a speculative diagnosis in these terms.

DISCUSSION

A case of hypertrophic inflammatory structure of the common bile duct in a previously fit man of 34 years is described. The structure was usually bypassed by cholecyst-enterostomy but destruction of the gall-bladder and eventual obstruction made a necessary to restore the continuity of the common bile duct.

It is noted that the structure was associated with squamous metaplasia of the mucosa, membrane of the common bile duct.

ACKNOWLEDGEMENTS

I am most grateful to Professor Ian Aird under whose charge this patient was admitted for his encouragement in recording the case and to Professor C. V. Harrison and the Department of Morbid Anatomy for details of the pathology.

I wish also to thank the Medical Director General of the Navy, Surgeon Vice Admiral Sir Cyril May, *KCB, CBE, MC, FRCS, QHR* for permission to publish.

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Reviews

A. FARRER (The University of New South Wales), *B. N. H. HALL*, and *J. L. LAMBERT* (The University of Sydney) with *the Editors* (London: H. K. Lewis, 1959) (Ninth Edition) (Pp. 1104) 10s.

This book, dating from 1929, 1935, 1945, and 1950, is a history of physiology. It is a roughly divided survey of physiological subjects as they have been treated in the past, e.g. the elementary chapters on histology, anatomy, etc.—rather than a consideration of events. Secondly, there is rather little of the physiology throughout the book. It is a historical and physiological primer, i.e. a history of physiology covering not a physiology, the vast important area of knowledge of physiology for the modernist.

It is an obvious criticism, to the extent that the book should cover the whole practice of physiology, but this has meant that a considerable amount of cross-referencing, and one of the main reasons why in order to keep the size of the book within reasonable limits. This is probably, however, as the frequent references which would otherwise be necessary, especially in view of the way in which the text is divided up. A more valuable, *Vita Medica*, is included containing a collection of all the most commonly required tables, experiments and exercises.

It is especially a work for the reader who has already had some experience of classical treatments for the elementary practical subjects but has not described in detail. On this other hand, the arrangement of more specialized chapters such as may be met with in the course of university studies are well described, and the advantages and disadvantages of various methods are thoroughly discussed. In the construction of a collection of notes this detailed discussion of classical text, without the whole which are ready reference source for discussion and progress, have been omitted. Also, it is pointed out that some students might well find this book—and the point, that students become the book, that is, the student over to learn the language. To avoid this possibility, only the well tried classical methods of text and lecture material is, described in detail, and a few important points are brought out—the advantages of some of the specialized chapters in the text with which the former can be supplemented.

Apart from the historical and scientific, the book contains excellent chapters on various subjects, such as the history of physiology, blood circulation, and such topics as physiology, anatomy, and the construction of various systems. The book, like the other, and its emphasis on physiology and pharmacology, makes a most excellent textbook for the student who has already given attention, and intends to study for the degree.

A. D. C.

BIOMEDICAL VALUE IN CLINICAL MEDICINE By R. G. EASTON, B.A., M.D., D.C.P.
Cambridge (Cambridge University Press) Pp. 148. Bristol John Wright and Sons Limited
Price 3s. 6d.

The number of biomedical tests performed in a hospital is large, and the physician must be expected to have a knowledge of all of them in his hand. This book is a book, in alphabetical order, of such tests that is to be used for a long time, together with the normal range of values, the physiological and pathological conditions on which these values are based, as to be used as a standard and the reference on which the test may be used.

Stories of the Services

ORIGINALS

Sergeant (later) Major W. H. EDGAR, C. B. D. F. T., died suddenly at Akaba (S. Palestine) on the 15th November 1943 at the age of 34. He joined the Royal Naval Medical Service, W. I. Surgeon Lieutenant in May 1939. Promoted British Lieutenant Commander in November 1940 Surgeon Commander in November 1941 Surgeon Captain in December 1942 and Surgeon Rear Admiral in January 1943. He was placed on the Retired List in September 1942 and resupplied until he returned to the Royal F. C. on the 14th December 1942.

Surgeon Rear Admiral Edgar was awarded the C. B. D. F. T. in January 1933 and the C. B. D. F. T. in 1941. On the 15th January 1942 he was appointed Honorary Physician to H. M. The King.

By P. D. series.

W. H. Edgar was S. H. Q. D. F. T. when our South Africa Hunter in 1934. In those days the gulf between a Surgeon Captain and a Surgeon Lieutenant was as many sceptic's mouth wider than it is today—but Surgeon Captain Edgar was different. His brain was back to the young doctors without ceremony and the delightful atmosphere of their hospital was something quite unforgettable. It was the good fortune to meet when Surgeon Rear Admiral Edgar from 1935 until 1941 while he was in charge of R. N. Hospital Akaba. There was, difficult days during, which the hospital was subjected in frequent trouble by the enemy but there were also happy days. The Surgeon Rear Admiral and his charming staff remained their own hospital regardless of the conditions involved. The Admiral was the most approachable of men and was always accessible for interviews on all subjects professional or private. When one had finished something, usually in light form in some other way in, would become, very often for a little while, and then make a return could not. Enough for your shortcomings—now let us look at the other side? The result would inevitably be a heart-breaking, piece of misery which would not have impaired a lasting memory. He had that same exceptional virtue of being kind to his patients at all costs. One knew from that day that he would answer his letters, unless collectively and consequently their loyalty was his as all men in the narrow degree. His medical life was one of unending demands. As the Memorial Chairman in Hunter when it was revealed that Harold Edgar had declined the post of Medical Director General because he felt it a position he could not discharge his duties with the efficiency he demanded of himself without the support of his life partner, one can say, filled with tears. It is a great privilege to have known them both.

Surgeon Commander R. W. WALFORD, R. N.

An anonymous correspondent writes:

His story, as told in the Service, will burn in all minds and hearts of the many warm members of the South of Surgeon Commander R. W. Walford. For Walford was essentially a collected personality and this was reflected by the complexity and efficiency in which he was held by the Ship's company for whom, medical care he had been responsible during his Service career.

The backbone of Ship's Ship was widely known throughout the Service and was used in a form of efficiency. Many officers and ratings will have come to remember his professional skill and the many acts of kindness during the normal course of duty for which he was responsible and will wish to offer their deep sympathy to his widow and family.

Surgeon-Lieutenant James Gordon SIMPSON, D.S.O., D.S.M., D.S.M. (A), who was one of the best known personalities in Cambridge during the 1910-1920 period at the age of 25.

He joined the R.N.R. in 1928 and gave loyal and enthusiastic service to its work for 1935.

During the War he was one of the pioneers of modern naval medicine, medicine and it much original work in the physiological and psychological aspects of being. He was President of Council for Medical Research and in charge of the courses at medical students. He also served as Medical Director on R.N. Auxiliary Hospital at Portsmouth.

H. E. D. C. writes:

James Simpson was an Uncle for his contemporaries when I first joined the Royal Navy and the descendants of a life-long friendship were his. Memories of that very happy summer are always mingled with those of James's happy and kindly personality. I can especially remember him playing regatta tennis, observed with a forecourt eye but without with the London style, and looking off the net well beyond a net and much observed him, looking out.

During the War his patients and colleagues got much more from him than medicine and that of a first-class physician. One could not be in his charged and operation company without feeling the help for it. We miss his presence and value his memory.

HONOURS AND AWARDS

Companion of the Most Honourable Order of the Bath

Surgeon Rear Admiral G. H. Gordon, D.S.O., D.P.M., D.C.P., D.S.M.

Surgeon Rear Admiral G. H. C. P. Gordon, D.S.O., D.S.M., D.C.P.

Officer of the Most Excellent Order of the British Empire

Surgeon Commander J. G. G. L. R. C. P. M. D.P.M., D.S.M.

HIGHER DECORATIONS

D.C.P.—Surgeon Commander F. W. Edmondson.

D.S.M. (A)—Surgeon Lieutenant-Commander P. J. Proctor.

D.C.M. & C.D.C.—Surgeon Lieutenant M. Whitcomb.

D.A.—Surgeon Lieutenant D. B. Longley.

PROMOTIONS

To Surgeon's or Adjutant Medical Director-General of the Navy—G. H. P. Gordon, D.C.P. (1945-46).

The following promoted subjects have been mentioned for promotion to date 30th June 1946:

To Surgeon Captain—G. H. G. Gordon, W. Wilson.

To Surgeon Commander—G. H. Gordon, D. R. Whiston.

To Surgeon Captain (A)—W. J. W. Gordon, D. L. Goodridge.

To Surgeon Commander (A)—D. F. Rogers.

ROYAL NAVAL RESERVE

(To date 31st December 1945)

To Surgeon Captain—A. E. R. Gordon.

To Surgeon Commander—A. G. B. Clavette, D. J. A. Brown, G. G. B. Hinde.

To Surgeon Captain (A)—J. Gordon.

To Surgeon Commander (A)—J. G. A. Payer, M. Bennett.

ENTRIES FOR SHORT SERVICE COMMISSION

R. J. A. Wallace M.B. B.S. M.R.C.S. L.R.C.P. D.A.C.C.D. I.W.M. Senior M.B.
 Ch.B. P.O. Gilman M.B. B.S. C.P. Jones M.B. B.S. J. M. Larkin M.B. B.S.
 M.R.C.S. L.R.C.P. G. Mackay M.B. Ch.B. J. G. Miller M.B. B.S. R. H.
 McCread M.B. B.S. M.R.C.S. L.R.C.P. E. I. Oates M.B. B.S. J. S. Pepp
 M.R.C.S. L.R.C.P. I. C. Sutherland M.R.C.S. L.R.C.P. D. J. Whitaker B.S.
 1955

WARDMASTER OFFICERS**PROMOTION**

To Wardmaster Sub Lieutenant.—E. P. G. Wilson

RETIREMENTS

Wardmaster Lieutenant-Commander A. E. Masters
 Wardmaster Lieutenant T. Moore

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE**HONOURS AND AWARDS**

British Empire Medal (Military Division)

Miss Lavinia Marston Barrage Head/V.A.D. Nursing Machine

Officer of the Royal Red Cross, Second Class

Miss F. F. Polingrove, Sister-in-Charge Sister
 Miss A. Bay Head/V.A.D. Nursing Machine

ENTRIES FOR SHORT SERVICE COMMISSION

Miss S. Burton V.M. Whitaker

TRANSFER TO SHORT SERVICE COMMISSION

Miss E. A. Lumsden, Senior Nursing Sister

On the evening of Monday, 5th February, 1955 members of the Portsmouth and Wight Junior Branch of the Institute of Medical Laboratory Technology were entertained at the Royal Naval Medical School.

The opening address by the Medical Officer in Charge was followed by a lecture by Surgeon Lieutenant S. Miles, R.N., on *Cervical Prolapse in Tropical Climate*. Two films were shown and there was also a laboratory demonstration of tropical parasites.

The evening ended with supper which was greatly appreciated and which was prepared by Wardmaster Lieutenant and Mrs. F. W. Macdonell.

JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE ANNUAL REPORT, 1939

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- 2011 — Courts—Medical Officers—Changes in Medical Aspects of Underwater Warfare and Survival at Sea in 1959
- 3080 — Medical—Examinations—Personnel Appointed to Posts in the Allied Command, Europe—Medical Examination and Deposit of Documents

1960

- 15 — Medical—Disclosure of Service Medical Records to Former Officers Re Service
- 16 — Medical—R. N. Bulletin No. 9—Distribution
- 14 — Q. A. R. N. N. — Naval Nursing Auxiliary Section—Introduction
- 65 — Naval Stores—Medical and Dental Stores—Print Supply Request Minutes, Tables R.111-112-57—Objections
- 67 — Dental Stores—Print of Form R.111-112-57—Introduction
- 115 — Medical—Tooth—Specimens—Supply Supply and Requirements in R. N., R. M. and W. R. N. (Personal Items and Dental—Ministry, Customs, General and White and Facilities of Naval and Admiralty Civilian Personnel Medical—Requirements)
- 161 — Medical—Specimens—Collecting—Models 11 and 12A—Supply to America

Notes

The Editor assumes no responsibility for sending or original papers on problems or subjects which present personal opinions, but—because of space and amount of material in the case of medical groups will be reviewed from time to time and suitable changes in form and design suggest changes of text, margins and design, are invited from time to time to authors.

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For R.M. and R.N.V.R. medical personnel on the staffs or retired but and for Consultants to the Royal Navy, the subscription is £10 per annum (postage included) payable in full January of each year. Single copies 2s.

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Captain Vice-Admiral W. E. K. FANCLERIE, C.B., Q.M.P.

Chief of

The Medical Branch of the Navy will note the retirement of Surgeon Vice-Admiral Sir Cyril May with regret, though this regret will be offset by the realization that a four-year tenure of strenuous activity, covering towards the end of a long and distinguished career, means rest and relief from the burdens of high office. The departure of Admiral May brings with it the end of yet another era, because he was the last remaining Naval Medical Officer to have served in the First World War, when his gallantry was recognized by the award of the Military Cross.

Those of us who are old enough to view as retrospect characteristics displayed by the various Medical Directors-General under whom we have served, are capable of assessing the achievements of each. In the natural course of things, the respective qualities of our Directors are legitimate subjects of subjective discussion and for comment. We frequently remark that 'X' was a better Director than 'Y' but that possibly 'Z' was better than either of them. At the same time we are speaking only of the totter of the capabilities of such Directors because their lack of capability is something which has never arisen.

The office of Medical Director-General of the Navy is one which calls for a multifarious array of attributes. Apart from his long Service experience and proved professional ability the holder must be a decisive and potent administrator of the highest order. His position is no easy one, his burdens are never light. He must make swift and far-reaching decisions, carefully balancing in the scale the pros and cons of various views which are constantly changing in the light of positive developments. He must accept the things which cannot be changed. He must have the courage to change the things which ought to be changed. Above all, he must possess the wisdom to distinguish between the unchangeable and the changeable. He must be a master of the art of diplomacy. He must combine the continuance of a system whereby ethical obligations may be harmoniously combined with Naval Discipline, so that Directors and Dental Surgeons may perform their duties without embarrassment. He may well have to solve great problems of personnel and supplies in the same hour as he considers some form of political protocol or, perhaps, traces the tedious and tortuous intricacies of the latest tangle of the Treasury. The essence of his life is restless service, dedicated to that task which is of paramount importance to the Nation, the preservation of the Health of the Navy.

The complex combination of qualities is not easy to find in a single individual. But that the combination is always forthcoming speaks well for the Medical Branch of the Navy. The necessary requirements were originally derived by James Lind, Robert Lee, Thomas Trotter and Gilbert Blane in the Eighteenth and early Nineteenth Centuries. In our own day they have been developed by Cassell, Bond, Hall, Nichols, Sheldon, Godley, Gosses, Bapty, MacKenzie and lately by Cyril May, each so different from the other, but each merged with the quality of Gosses.

We shall greatly miss Sir Cyril May, and we wish him and Lady May many years of health and happiness in well-earned retirement.

In the person of Surgeon Vice-Admiral W. B. S. Fawcett whose photograph we are privileged to publish, a worthy successor has again been found so that the Medical Branch may continue in view the future with confidence and in the full knowledge that its welfare has been placed in capable hands. We wish Admiral Fawcett all success during his term of office which we are sure will be long.

Review

by Sir James Spence

PERSONNEL RESEARCH

200

Surgeon Captain F. F. KILLS, R.N.

THE intention in this paper is to indicate what is meant by the branch of naval medical research which is at present designated "personnel research" and to review the various fields of interest which have been explored in the last eighteen years: the organizations for doing personnel research and the part to be played by naval medical officers.

The Royal Naval Scientific Service is responsible for research to provide information which is necessary in the development of naval weapons, detection and communication systems, propulsion and auxiliary machinery and the construction of ships where it cannot be obtained from existing sources. The Scientific Service is not responsible for naval medical research. This falls within the province of the Medical Director General of the Navy. The Scientific Service does, however, provide financial support for medical research of particular naval relevance which is not being carried out elsewhere, and for the establishment of special laboratories or research groups for studying problems which cannot be handled conveniently in other ways, for example, underwater physiology at the Royal Naval Physiological Laboratory or the effects of hot climates on man which were investigated at a Tropical Research Unit in Singapore from 1948 to 1953.

The purpose of the Royal Naval Medical Service is primarily the treatment of the sick and wounded and the practice of preventive medicine. Such conventional medical research as may be done is usually part time and stems largely from individual interests and enthusiasms. Professional and course structures are formed accordingly. There are few full-time research workers, but many have research interests. It is expected that the results of conventional medical research in universities, hospitals and national and industrial research institutes will be applied in the Navy, as they are in the National Health Service and University Departments, through the initiative of the independent medical officers the medical and scientific personnel he meets, the learned societies to which he belongs, post-graduate instruction, consultant services and, occasionally through the medium of special committees, where

there are necessary. It is essentially a personal responsibility for the individual to ensure that he is, and remains, professionally competent and up to date.

This does not, however, complete the picture. The naval environment and the requirements of naval operations impose conditions on personnel which sometimes fall outside the experience of conventional medical practice on shore, where the short-time expert cannot be expected to appreciate in their full significance, learned though he may be, and which he has at times been known to prefer to ignore. Thus when scurvy was rampant in the Fleet in 1855, even Sydenham remarked that "the two great characteristics of epidemic naval physicians were malignity and the scurvy which they blamed for disorders that symptoms often owing to their own mismanagement." He had not been on a long sea voyage, and it was more than a hundred years before sea surgeons and physicians became such hard-boiled people; where and whether study of the reforms which were necessary to preserve the health of seamen.

When this has been said, however, it must be admitted that during the last two centuries there has been a rich cross-fertilization of ideas between the naval medical departments and the medical officers and those who have requested themselves with exploring and defining the fundamental requirements for satisfactory sea hygiene and nutrition. In the twentieth century this fruitful association has expanded to embrace a just consideration of the complex environment of the submarine sailor, the deep sea and shallow-water diver and the naval aviator, an ever-growing range of widely diverse environmental stresses encountered by the industrial hygienist, and some hazards associated with atomic biological and radiological defense.

Until relatively recent years there was no formal machinery to enable the Admiralty to call on civilian medical scientific advice other than the channels referred to above which are available to the profession as a whole. From time to time committees with outside experts serving on them were set up to deal with special problems, such as the Admiralty Nutrition Committee of 1914 and 1927 or the Physiological Subcommittee of the Admiralty Submarine Escape Committee in 1938, but there was a lack of continuity about the temporary committee procedure which was unsatisfactory for dealing with a complex of environments which were forever changing with operational requirements, and new developments in weapons and weapon systems. It is of value to review briefly how a change in this state of affairs came about.

In 1930 the Medical Research Committee, established in 1915 to administer funds set aside for research by the National Health Insurance Act of 1911, became the Medical Research Council of the Committee of Privy Council for Medical Research. In those days the Lord President of the Council was the Minister directly responsible for the conduct of his affairs. Today the Minister of Science, the Lord Privy Seal, is the responsible Minister and the Council is not responsible to the Privy Council. During the formative years, between the two World Wars, it is not surprising that the Council was busy occupied with problems of military medicine. For disarmament after the 'war to end

tion" is a popular theme in the minds of many people. A study of interest stress requirements in the Royal Navy was undertaken, however, and the results were published in 1931, and throughout that period the Council's Industrial Fatigue Research Board, which developed in 1936 from the Health of Munition Workers' Committee established in 1913, and which was later succeeded by the Industrial Health Research Board, collected accurate scientific data on problems of industrial physiology and psychology much of which was to prove directly relevant later to the requirements of the Services.

By 1939 it was apparent that war was imminent, and that the pattern of the British medical research effort required to be modified and expanded to meet the emergency. It was logical with the great stresses, speeds and accelerations which were being imposed by the new designs of fighter aircraft coming into service, that attention focused first on the needs of the aviator in the air and the Secretary of State for Air appointed a Flying Personnel Research Committee to advise on "the medical aspects of all matters affecting Royal Air Force personnel, which might tend to safety and efficiency in flying including research into problems associated with the scientific selection of flying personnel and into measures designed to maintain their physiological efficiency." It is significant that the first Chairman and the Chairman throughout World War II, was the late Sir Edward Mellorby, the Secretary of the Medical Research Council, and the Scientific Member includes several members of the Council, but it was, and still is, a Committee of the Air Ministry not a Committee appointed by the Medical Research Council. This committee is now responsible for advising not only the Royal Air Force, but also the Admiralty and the Ministry of Civil Aviation where the needs of the aviator in the air are concerned. The Medical Director-General of the Navy is represented on the Committee and naval medical officers and psychologists work as integral members of the staff of the Air Ministry's Institute of Aviation Medicine where research on these problems is carried on in England today.

In 1940, following the evacuation of the British Expeditionary Force from Dunkirk the Army Council asked the Medical Research Council to establish a Body Protection Committee, on which representatives of the General Staff and the Royal Army Medical Corps worked with civilian scientists to advise on body, eye and head protection, and in 1941 this Committee was strengthened and became the Military Personnel Research Committee. Unlike the Flying Personnel Research Committee this Committee was, like its successor—the recently re-constituted Army Personnel Research Committee—a Committee appointed by the Council but by the Service Ministry. Its interests were not still are, related primarily to "devising ways and means of ensuring the maximum safety, efficiency and comfort of the healthy soldier in active service" not with the care and treatment of the sick and wounded.

When there were mutual interests the Admiralty participated actively in the affairs of both these personnel research committees, notably where these concerned the prevention of motion sickness, the use of sunglasses, visual

problems, and, of course, fixing personnel requirements, and for a time there did not appear to be too pressing a need for the establishment of a separate committee to consider naval problems.

However, in August, 1916 Sir Edward Mellanby had written to the Board of Admiralty offering the assistance of the Council's organization and scientific staff in the event of war, and the Medical Director-General was experienced throughout the war in numerous instances of the Council which considered the treatment of war wounds, haemoglobin, nerve injuries, traumatic shock, malaria, typhus, pneumonia trials, blood transfusion methods and the care of shipwrecked personnel. The last-named of these considerations—the Committee on the Care of Shipwrecked Personnel—published a Memorandum in 1945 which became the rule system by the potential shipwreck survivors enjoying a wider circulation than any other of the Council's war memoranda. The Medical Director-General of the Navy at this time, Surgeon Vice-Admiral Sir Rhidian Dudley, was its Chairman, and as the Committee concluded its consideration of the problems before it in 1943 the Admiralty revived the Council to set up a Royal Naval Personnel Research Committee.

The Committee first met on 17th November, 1942. Sir Edward Mellanby was the Chairman and Dr G. L. Brown was appointed Secretary. It has functioned continuously since that time. Dr Brown (now Professor Sir Lennox Brown) succeeding Sir A. Jones as Chairman when the latter retired in 1946. Apart from the civilian scientific members of the Committee the Admiralty is represented by the Medical Director-General of the Navy and one other naval medical officer, the Deputy Controller (Research and Development), the Senior Psychologist, and the Assistant Director of Tactics and Weapons Policy, who represents the Naval Staff and on other Admiralty appointments men as the business of the Committee requires. The council appoints a Secretary and Assistant Secretary from its Headquarters' Staff.

The terms of reference of the Committee, revised at the sixth meeting on 15th March, 1945, are to advise the Medical Research Council 'on such investigations as the Council may be asked to undertake (by the Admiralty) on biological, medical and psychological problems affecting the health and fighting efficiency of naval personnel; and to suggest investigations with a view to increasing or improving the health, fighting fitness and circumstances of naval personnel; and to set and supervise such investigations as expedient'. In practice, like the Army Committee and somewhat contrary to the terms of reference, the Committee has confined its activities largely to the physiological and psychological problems and rarely trespasses into areas already covered adequately by other medical committees or organizations, or by the existing Service medical departments. This is still the policy although the way is obviously clear for the Committee to expand its activities in any direction it wishes, if the need should arise.

The term 'personnel research' owes its origin very largely to its use in the titles of these three committees and in England, where it is used in a medical context, it generally refers to activities such as the ones with which these

commitment have been concerned. Elsewhere it may be interpreted differently. In South Africa personnel research is primarily the province of non-medical psychologists and the field covered is in some ways more restricted. Conversely it could easily be interpreted more comprehensively than it is in Britain today. It is no longer a term that there is much to be said from the naval viewpoint for dropping it altogether and simply referring to "medical research" and the Medical Research Council's "Naval Naval Committee" for in practice most new problems on which the Council's advice is required in the Admiralty are referred in the first place by the Medical Director General of the Navy to the Secretary of the R.N.P.R.C. who nowadays has an office in the Admiralty to handle the very considerable day-to-day administrative affairs of the Committee, and "medical" research does after all include the investigation of the problems of the fit as well as the unfit. However, for the time being no doubt we shall continue to talk of personnel research, but it is important to note that the Navy's medical interests have become so closely linked with those of the Medical Research Council where there is common ground, that it is incorrect to regard the R.N.P.R.C. purely as a committee with physiological and psychological interests, although it is true that up to the present there have been predominantly *in vivo* transactions.

When problems are referred to the R.N.P.R.C. Secretariat which fall outside the immediate province of any of its working Subcommittees or panels, they can usually be passed on to one or other of the Council's numerous committees, referred directly to one or more of its many expert advisers, research units, groups or other associated organizations, or if a long-term commitment is involved, a new subcommittee may be formed or a new unit may be set up to study a particular problem or series of problems.

It is probably true to say that personnel research has still to find its precise level and identity. It may be that the present state of effort is hindered somewhat artificially by the circumstances of the cold-war years which we hope we may be about to leave behind us. Or it may be that this is more likely that more scientific thought effort and money will have to be expended on the study of the human and environmental factors which are important to the efficiency, health and morale of naval personnel and therefore to the Navy as a whole.

PERSONNEL RESEARCH IN THE NAVY 1940-1950

After the formation of the R.N.P.R.C. in 1940 the first investigation was in study conditions in the first motor craft of the Coastal Force, Commanded by Rear-Admiral Sir John Jellicoe, in the United Kingdom's eastern problem areas. A physiologist was appointed to the Directorate of Coastal Force Material and during the remainder of the war ships were taken to drill with such matters as carbon monoxide poisoning, excessive noise, ventilation and reduction of condensation, and the design of good lifeboats and life jackets which could be quickly donned in emergency. Climate research engaged the attention of the Committee at the outset of its deliberations, and an advisory

was sent with a Northern Conway on the Manhattan run in winter to report on the various situations in which he thought the Committee might help. The success of this direct approach and the value of his report to the Naval Staff was such that he was sent to make similar observations in the Mediterranean, Indian Oceans and South Atlantic—a wide survey which was followed by the appointment of a Transition Subcommittee (later called the "Hydrability") and then the "Climate Efficiency Subcommittee") and the dispatch of the Hydrobiological Mission to the Eastern Fleet and British Pacific Fleet in 1944. In this way detailed observations on the environment between decks were made until the end of the war as part of a broader programme in which reference will be made later.

Another early activity of the Committee was in underwater physiology. Arising out of the transactions of the Admiralty Committee on Submarine Escape which was convened following the pre-war loss of H.M. Submarine *Thetis*, physiological experiments were undertaken to study, *inter alia*, the effects of high partial pressures of oxygen and carbon dioxide, which served more to show the magnitude of the problems rather than to solve them. By the middle of the war, however, the operational importance of these two factors came dramatically to the fore with developments in underwater warfare. "Top Secret" at that time, which led eventually to the 'human torpedo' propelled by a diver using self-contained breathing apparatus and K Croft, rubber submarines from which it was possible for divers to operate on many anchorages. Two other aspects of this type of operation which were investigated were the effects of rapid changes in pressure on divers' ears on surfacing or surfacing too rapidly, and the effects of pressure waves from exploding depth or demolition charges on men underwater in which information was needed to protect beach parties and others. A Subcommittee on Underwater physiology with Dr. Brown as the Chair was appointed early in 1945 to advise on such matters and naturally included within its terms of reference the problems of submarine atmospheres and of deep diving cylinders, airlocks and airlocks bubble formation on surfacing too rapidly (the "Bends"). For obvious reasons very few knew of the activities of this group during the war, but they became one of the most active and productive of the wartime Subcommittees (starting as late as one month at the post). The Royal Naval Physiological Laboratory was established on the recommendation of the R.N.P.R.C. and worked in close collaboration with groups at the National Institute for Medical Research and the Admiralty Experimental Diving Unit and with the medical efforts attached to the operational units in training.

A more conscious though nevertheless important group of problems also arose in the provision of naval gannery, concerned with the anatomical relationships involved in the design of divers' and air lock exit lights in relation to sitting and manual and pedal-operated controls. Associated with these were various difficulties in helmet and clothing design. A Gannery Subcommittee and a Clothing Subcommittee were formed to handle these problems and the former in an early date extended its activities to include

investigations of the effects of morale blast and gas house conditions when consideration in the Arctic and elsewhere had in the tropics focused the worst cases. In gas tight living quarters not only chemical factors but the need for economizing in the energy cost of keeping the very heavy airtight charges and propellants upon which the rate of fire depended in the enclosed and unventilated heating rooms, messrooms and shell rooms also imposed a series of intensified physiological stresses which occupied the time of several groups of investigators until well after the end of the war.

There was another wartime Subcommittee which only met a few times to discuss the problems of the radio operator. These were primarily concerned with selection and training of operators, the construction of radio cabinets, and later with the design and lighting of controls and displays. These activities were transferred to the Gunners Subcommittee when the latter changed its name and its terms of reference and became the "Operational Efficiency Subcommittee" some time after the war ended.

These groups were responsible for most of the wartime studies sponsored by the R.N.P.R.C. The chronic habitability investigations included the examination in controlled climate chambers, situated in the National Hospital, Queen Square, London, and in the Medical Research Council's Applied Psychology Research Unit at Cambridge of the physiological and psychological effects of work at high temperatures with the objective of obtaining factual evidence concerning the effects of this chronic stress on efficiency. These were essentially pilot studies designed to develop work "artificially unbalanced" moral ratings in subjects, techniques which would be employed in a tropical laboratory to measure the effects of working under excessively warm conditions on "specifically unbalanced" men. The emphasis on this aspect of the Committee's work was considerable for there was very real uncertainty concerning the possible failure of the "human factor" if it was compromised as only partially experienced Fleet had to fight a prolonged action against the Japanese in the tropics, particularly in the light of the earlier disasters in the Java Sea and off the coast of Malaya when H.M.S. *Pencer* of Hales and H.M.S. *Rapide* were sunk, and at that time many crewed the North War would continue at least until 1947. Professor H. C. Blaxter, an Englishman who was the Professor of Physiology at the University of Pennsylvania and a world authority on the physiology of work at high temperatures, and Surgeon Captain Mackintosh Goughley, Consulting Neurologist and Chairman of the Habitability Subcommittee, explored possible uses for a tropical laboratory in the Eastern Theatre of Operations and selected a laboratory in Bombay which the Government of India agreed to make available.

As a result of this year's work many practical suggestions were made, which materially improved the working conditions in the Fleet and indicated where the most weaknesses lay so far as the men were concerned. A notable development by the Gunners Subcommittee was the "Mock-up" Panel comprising an anatomist, a physiologist and a psychologist, which went to see the "mocked-up" models of new weapons or other equipment before the

designs was useful, in company with the users' designers and material department representatives. They were able to influence the design of a number of pieces of "navy hardware" to enable them to be operated more efficiently by the average man, which were in use before the war ended. One of the weapons improved in this way being a new Corbion gun, the overall performance of which was greatly improved by simple modifications which could not, however, have been incorporated in a later stage of development. This approach, which has tapped knowledge, when new equipment of this type comes along at such low frequent intervals, had much to commend it, and although it could not be described as research, at this stage of the war its results were almost certainly of more practical value to the Navy than some of the more systematic and basic studies in laboratories and more (has pushed the *ad hoc* direction in this way of the designated scientists who were members of the Panel.

In the early part of the year the Royal Naval Physiological Laboratory dropped most of its physiological work to concentrate on the biophysical problem of poisoning drivers in the tank destruction teams and tank crew clearance parties with protection against the underwater effects of their own charges or the enemy's bombs, mines or depth charges during the invasion of Europe, which took place in the Spring.

The war ended earlier than had been envisaged in early 1944, and some portion of this was apparent soon after the New Year, 1945, opened. It became likely that the results of the more systematic and time-consuming laboratory research would not be applied until after the war ended. This caused some re-examination of the Committee's aims which, formerly focused on the type of project which would help to win the war, now emphasized the need to develop the research programmes so that the more basic needs of the Navy for the type of assistance which the Medical Research Council could provide would be met, not only for the remainder of the war but in the years that came after.

The "Biology project" was abandoned early in the year on the advice of the Supreme Allied Commander, South East Asia, who urged that the Committee should visit and Singapore, being on the Equator was unsuitable. This advice, which was accepted, eventually led to the establishment of the Royal Naval Tropical Research Unit at Singapore, but experimental work did not recommence there until the latter months of 1945, and the remainder of 1945 was devoted largely to a continuation and expansion of the sciences outlined above. The domestic publications of the Reports of the Hydrobiological Museum and the Pacific Fleet Unit, as an *in-house* study to determine the bacterial content of the air of a cruiser and of a submarine under operational conditions, and the first of a number of hydrobiological cruises in new types of submarines on which medical observers were carried provided the main areas of interest.

Any account of wartime personnel research in the Navy would be incomplete without a further brief reference to the Clothing Subcommittee mentioned above and the Food Problems Committee. The former Subcommittee was

were added in, when not only the 'sighting problem' is discussed and put across, but on the problem of fresh protection of divers in including protection against flash and flame, the various types of, immersion and extreme cold, which led to the design of new types of sea-flash gas, body armour, immersion clothing and a wide range of suit weather items for trial in adoption into service.

Under the Visual Problems Subcommittee was constituted the Admiralty School on the Visual Subcommittee of the Flying Personnel Research Committee for colour. A number of peculiarly naval problems arose, however, such as the visibility of submerged submarines and of ships downlight under searchlight illumination, the best type of sea glasses for various naval uses, the most suitable goggles for pilots landing on a carrier flight deck into the sea, the visual aspects of naval camouflage and so on, which called for something more. The Subcommittee collaborated with the Admiralty Research Laboratory in an attempt to develop satisfactory tests of night vision and conducted an investigation to determine the most suitable method for testing colour vision in the Navy. The latter probably provided the most significant contribution. The Medical Research Council's Colour Vision Committee (1933) mentioned above, had pointed out certain defects in the then current method of using the Edridge Green Lantern. This lantern did not lend itself to the necessary modifications, however, and the Subcommittee were able to show that when it was compared with the more strictly standardized Martin Lantern, using the ability of the subjects to read numbers colour forms as the control, the Martin Lantern was the more efficient in picking out those with defective colour vision. The Martin Lantern was therefore recommended for use in the Navy and ultimately adopted.

When the end of the war came the position came under critical review. The Board of Admiralty and the Council were both in favour of continuing the work which had been commenced under the Committee's auspices in the post-war years. Formal approval was obtained from the Treasury for the financial support by the Admiralty where necessary, of research carried out by the Personnel Research Committee in University and other non-naval research establishments. Many of those who had been responsible for the wartime arrangements, both in and out of uniform returned to their previous occupations, but surprisingly enough the level of activity did in fact not fall off. On the contrary some expansion was to be seen in the establishment of a Survival-at-Sea Subcommittee in 1946 to study the problems of survivors at sea, etc., an Underwater Blast Subcommittee in 1947 to examine the phenomena responsible for injuries to divers or surface swimmers by underwater explosions, and the best ways of protecting personnel against this type of injury, and a Subcommittee to study problems in the Women's Royal Naval Service. The latter was never effective and has now been wound up, but the other two have both made outstanding contributions in the post-war years. A number of visits to Germany, France and Italy were also made in the immediate months of the war and early post-war years by observers to find out

what progress in personnel research had been made in Europe during the war.

1945 saw the commencement of the tropical studies at Singapore where they were continued for the next five years, and after separate despatches with Canada and the United States in Toronto in July, the dispatch of a cancer boat, *Neve*, to northern waters in the winter months with a strong team of naval and civilian scientists to observe the effects of very cold operating conditions.

It was inevitable, however, that there would eventually be some slowing of the tempo with the departure of most of the wartime investigators and their replacements by others who were new to the work, who lacked the familiarity of the wartime Navy and its urgent problems. Committees began to meet twice a year instead of twice a month, some of them did not meet even that often, and others became completely inactive. Research is not self-sustaining, it can only thrive on new problems and new ideas and there were for a time few readily forthcoming.

The outstanding activities of the post-war years have been those which stemmed from the deliberations of two Admiralty Committees, one dealing with the problems of escape from various submarines and one with aerial life-saving equipment and training, which were concerned chiefly with the war against a series of aerial crises in the first scheduled submarine war, an extensive series of physiological and psychological studies on the effects of work at high temperatures at Singapore; the establishment of a Royal Naval Unit at Cambridge to support the work of the Medical Research Council's Applied Psychology Research Unit and Unit for Research in Experimental Medicine on a semi-permanent basis; a series of experiments and trials carried out from the Royal Naval Physiological Laboratory to amplify what was already known about the phenomena of underwater blast and how to protect against them, and the establishment of staff member Submarine, the first to advise on breathing maintenance and protection against high altitude stress.

As a result of the first of these the Admiralty Staffing Committee on Submarine Escape was formed. The breath method of buoyant ascent without the use of any breathing apparatus was evolved and the 100-foot escape training tower at H M S. Dolphin was built. All the pioneer physiological research associated with this approach to a complex problem was carried out by the Royal Naval Physiological Laboratory and Royal Naval Medical School staffs. Many thousands of buoyant ascents have now been accomplished in the escape tower, whilst in September 1959 successful buoyant ascents were made from a submarine of the United States Navy when lying at a depth of more than 300 feet off Key West, Florida, to test the end of success on the method.

This Laboratory has also been responsible for studies in the pressure chamber and very numerous trial dives at sea which were designed to effect improvements in the Royal Navy's decompression tables. An indirect result of this work was that when the Royal Navy broke the world deep diving record recently, a dive which was supervised by the naval medical officer who

was responsible for the last improvements and trials which led to the revision of the diving tables as these are used today.

The recommendations of the Life Saving Committee led to the formation of the Naval (Naval) Life-saving Committee which has since developed the new rubber trunks and night non-suits and their equipment and the training procedures connected with these. The R.N.P.N.C.'s Survival at-Sea Subcommittee had advised on the physiological and medical aspects, carrying out raft trials in northern temperate and tropical waters to identify the appropriate possible criteria for a four day deep survival, and other trials to identify the most suitable means unknown remedy as the best way of obtaining adequate supplies of possible water. The submarine habitability experiments referred to earlier involved a seven-week period of observations towards the end of 1945 in the first A-class submarine which was one of course found at that time with the submarine. This was followed in 1947 and 1948 by three long submergence cruises in different locations on all of which medical observations were carried to measure the environmental factors and observe the effects on the crew, particularly the naval effect of fluctuating, semi-phobic pressures and occasional sharp changes in pressure. These enabled the characteristics of the 'submergence submarine' environment to be identified.

The studies at Singapore provided the climax to the wartime programme of climate research, and much of the information which is needed to define the requirements of men who have to live and work in warm climates or for short periods in high temperature, although further work on the latter aspect, and probably the former too, may be called for later. The work of the Applied Physiology Unit at Cambridge has been closely co-ordinated with that of the Department of the Senior Psychologist, Admiralty and the Unit for Research in Working and Climate Efficiency at the University of Oxford, to solve many of the naval problems of the human operator and his equipment under the eyes of the Operational Efficiency Subcommittee. The underwater blast studies have been completed and the results have been applied as appropriate to most the needs of the Naval Staff. Lastly, the Hearing Subcommittee, in surveying noise hazards on hearing hazardous situations where ear protection is necessary, and advising on the practice of noise audiometry and the standards of hearing to be required of different categories of naval personnel.

During the past year 1959 the main prominent topics which have been discussed or investigated by the R.N.P.N.C. and its various Committees have included the effects of low of sleep on efficiency, the effects of immersion in very cold water and ways of protecting immersed personnel, the physiological principles basic to the design of ventilated suits for wear in very hot environments, the evaluation of the noise hazards for various subjects, further studies to investigate the effects of noise on hearing and on performance and the possibility of survivors doing out their fresh water supplies by drinking some sea water, a practice which has now been considered to be unacceptable in the Navy. In addition various new methods for measuring unconscious persons, primarily in first aid situations including exhaled air resuscitation,

have been conducted in accordance with the Research Department of Anesthesiology of the Royal College of Surgeons of England by direct arrangement with the Medical Director-General, and consideration of the adoption of the latter method by the Navy has now been referred to the R.N.F.R.C.

This brings the story nearly up to date. No detailed reference has been made hitherto to those aspects of research which previously concerned flying personnel which are drawn together with the work of the F.P.R.C. elsewhere. With the advent of the nuclear-powered submarine the study of submarine environments will have to be carried considerably further than was necessary for the 'pre-war' or 'subminiaturizing' submarines and eventually towards a continuous twenty-four-hour day seven-day work exposure in an enclosed space sustained for weeks on end rather than intermittent exposures with daily fresh air refreshment for several hours.

No attempt has been made in this short account of eighteen years of Naval personal research to discuss the results attained in any detail or to list the names of the numerous individuals within the Navy and medical officers and officers of other branches, and members of the Scientific Service, or outside the Navy—in universities, research institutes, other Government departments, or in the other military Services—who took part. It must suffice to say that a great many individuals were concerned. The relevant papers and reports are available in the Admiralty and in the Royal Naval Medical School and much of the work has been published or incorporated in Books of Reference for those who wish to pursue the matter further. But enough has been said to show the pattern which has been followed so far, and how this has been dictated primarily by the needs of the naval war for technical information necessary for the maintenance of operational efficiency, and by the war's initiative in bringing the problems requiring research on shore to the attention of the R.N.F.R.C. through the normal Service channels.

THE RESEARCH

In brief these lie from the establishment of one or the appropriate laboratories of the Royal Naval Scientific Service—the Royal Naval Physiological Laboratory, the Admiralty Research Laboratory out of the Royal Naval Medical Service—the Royal Naval Medical School, Royal Naval Air Medical School, medical officers attached to the Institute of Aviation Medicine, Portsmouth, others attached elsewhere to other laboratories, institutes or Government departments, the naval hospitals and various Committees of the Medical Research Council, particularly but by no means exclusively, the Royal Naval Personal Research Committee, and a variety of inter-Departmental committees.

Those who do the work are, however, more important than the place in which they do it, and at least as important as the administrative structure which supports them, and then applies to personal research as much as it does to any other field of scientific endeavour. The selection of the most suitable man, or group, for the solution of a particular problem by the

R.N.P.R.C. and the medical and biochemistry of the Committee is assuming that first things come first: that the main effort is exerted in the direction where the Navy needs it most, and that personnel research in the Navy is co-ordinated smoothly and effectively with similar endeavours elsewhere in the country, the Commonwealth, the United States of America, and the North Atlantic Treaty countries, as appropriate, and the principal concerns which are essential.

THE ROLE OF THE NAVAL OFFICERS

From the very nature of the problems under discussion it is obvious that the naval officers has had a large part to play in these events up to the present. The backbone of the Operational Efficiency Subcommittee was provided for very many years by junior officers, gun-mounting captain officers, and these co-operated with communications together with their colleagues of the Royal Naval Scientific Service who were engaged with them on developmental work. The Superintendent of Diving provides the main stimulus for the aspect of the work of the Underwater Physiology Subcommittee and Flag Officer Submarines, and the Standing Committee on Submarine Escape sponsor most of the remainder of its activities. The Chairman of the Naval Life Saving Committee and the members provide the practical problems on which medical advice is needed from the Survival-at-Sea Committee, and the Hearing Sub-committee is guided by the various departments who have to cope with noise reduction, the protection of personnel and the use of hearing as detection systems, such as those which employ noise or water apparatus. Medical officers apart, the naval officers' contribution has generally been on the staff or national advice rather than by direct participation in research, but there have been a considerable number of notable exceptions over the years.

It is only natural as the primary object is the study of man, not of his hardware, that medical officers should have participated in this work to a much greater extent than those of other branches. They have either participated in or carried out nearly all the studies in ships and submarines since the first chamber sailed for Marmansk in 1942. They also played their part in the wartime laboratory studies of the groups at the Naval Hospital, Queen Square, the Applied Psychology Research Unit, Cambridge, and the Admiralty Experimental Diving Unit, Singapore, the Unit for Research on Working and Chemical Efficiency, Oxford, the Department of Experimental Medicine, Cambridge, the Warburton Research Unit on Deaths in King's College, and the Research Department of Anaesthetics, Royal College of Surgeons. There have also been very many 'hobby-men', those who while fully employed in another capacity in naval hospitals, ships or other appointments, have given freely of their time and taken on added commitments to help along projects which at times could not have been accomplished without this assistance. For some and those specialist specialists in ophthalmology, anaesthetics, pathology, medicine and hygiene as well as non-specialist medical officers, have made notable contributions to naval personnel research, as the authorities of

the R.N.F.R.C. reports clearly shows. It is on these points we know that the success of the contribution made by the Medical Branch largely depends.

The time has long passed when the naval medical officer who wished to engage in the investigation of a problem is likely to be greeted with cold discouragement, provided his project is wisely conceived and he is competent to handle it, either with or without outside advice and assistance which can be obtained in a variety of ways outside the scope of this paper.

One of the difficulties encountered frequently in practical research is to define the problem, to identify the components which are likely to impound so laboriously in field investigations and visit they are defined to keep properly "on the rails" to ensure that the answer eventually obtained is directly relevant to the practical facts of the situation. This is where the medical or non-medical "middle man" has in the past made his greatest contribution.

Not all naval medical officers have the inclination or the ability to engage in research with its inherent investigations. Probably not more than one in ten will have the opportunity. It is of obvious importance therefore both to the Service and the individual that the efforts of those who do tackle the problems, whether in practical research or in other fields, should be productive and satisfying, and, where there are common answers between groups, co-ordinated. For this reason medical officers are requested by Admiralty Fleet Order 1204/59 to inform the Medical Director-General of the Navy and the Director of Medical Research at the Royal Naval Medical School through the appropriate Service channels, of any medical or applied medical research which is initiated in the hospital establishments or ships to which they are appointed, and to furnish a brief description of the scope and object of the work. This enables assistance to be given at times when it is needed and keeps the Medical Director-General informed as to where the medical research potential in the Navy is to be found.

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FURTHER CLINICAL TRIAL OF A NEW ANTHELMINTIC DITHIOCARBIN (PFIZER) BRAND OF DITHIAZANINE

III

Sergeant Commander J. GLASS, R.N.

Following the clinical trial conducted in the wards of the Naval Base Hospital, Singapore, to assess the effectivity of Dithiozin (Pfizer) brand of Dithiazanine as a broad spectrum anthelmintic reported in the *Journal*, on the Royal Naval Medical Service, 49, No. 3, 1958, a second therapeutic trial was conducted shortly after the first, using the same substance in various coated forms, each containing 100 mg. Dithiazanine.

PLAN OF TRIAL

30 cases were selected and divided into groups of 5. Each of these groups of 5 cases comprised of male or female selected by Medical Officers concerned from patients' medical check laboratory reports, were given graduated dosage to determine maximum effectivity linked to convenient time and frequency dosage.

FORMS OF TRIAL

	Dosage and frequency	Food or gruel
First group	100 mg. i.d. for 3 days	4.5
Second group	100 mg. i.d. for 3 days	1.5
Third group	100 mg. i.d. for 3 days	4.1
Fourth Group	100 mg. i.d. for 3 days	2.5
Fifth Group	100 mg. i.d. for 1 day	2.7
Sixth Group	1,000 mg. b.i.d. for 1 day	2.8

The results of treatment and trial details were recorded, following laboratory reports on three follow up stool checks on completion of dosage in each case. The final stool check took place four days after completion of therapy to exclude repetition of residual ova.

Notes on tolerance and side effects were recorded in the case bed notes as well as any other circumstances considered by the Medical Officer in charge of case to be of any interest for the purpose of this second trial.

FINDINGS

Tables I to V record the trial features and results on the 30 cases under review.

76 *Food of the South American Salamander (Peters) Breed of Deshastrea*

TABLE 3.—*See GASTON. Food of TROPICAL BATRACHIA*
(21) *Desm. (21)* Group 500 mg. *1 d* for one day. Total 1.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese stages of Gastritis
1	20	Male	AS TR & ANC	Failed AS & ANC Good for TR	
2	41	Indian	AS TR & ANC	Failed AS TR & ANC	Cardinal thrombosis
3	23	Chinese	AS & TR	Good for both	Multiple both
4	21	European	AS & TR	Failed AS & TR	Multiple
5	21	Indian	AS & TR	Good both	Infected both

Case Nos 7 and 8, 11 and 12, 13 and 14 are 3 individual persons who were given several courses of the same dosage and in case nos 12 and 14 the second course failed to clear American infection in the repeated dosage.

(22) *Desm. (22)* Group 500 mg. *1 d* for one day. Total 1.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese P.D. stomach culture
1	20	Indian	AS & TR	Failed AS & TR	
2	20	Indian	AS & TR	Good both	Chloroparaphysia
3	20	Male	AS & TR	Good both	Infected (P.D.)
4	21	Indian	AS & TR	Good both	Infected of legs

(23) *Desm. (23)* Group 700 mg. *1 d* for one day. Total 4.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese stages of Gastritis
1	17	Indian	AS & TR	Failed TR	
2	17	Indian	AS & TR	Good both	Good AS. Gastr. Media
3	17	Indian	AS & TR	Failed AS	Chloroparaphysia, stomach.
4	17	Male	AS & TR	Failed AS	none
5	17	Male	AS & TR	Good both	Infestation (L.) both

(24) *Desm. (24)* Group 500 mg. *1 d* for one day. Total 1.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese Stages of Inf. Stomach
1	17	Male	AS & TR	Failed both	
2	17	Indian	AS & TR	Good both	Ascaris
3	17	Indian	ENT & TR & TR	Good both	Tenaculum
4	17	Indian	AS & TR	Good both	Infestation of stomach
5	17	Indian	AS & TR	Good both	Brachyopocystoma

(25) *Desm. (25)* Group 500 mg. *1 d* for one day. Total 1.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese stages of Gastritis
1	17	Indian	TR	Good	Ascaris intestinal
2	17	Indian	AS & TR	Good both	Infected both
3	17	Male	AS	Good	Ascaris intestinal, can. gastritis
4	17	Chinese	AS	Good	Chloroparaphysia of legs
5	17	Indian	AS	Good	Polysporous tuberculous

(26) *Desm. (26)* Group 1,000 mg. *1 d* for one day. Total 1.5 g.

Case	Age	Sex	Age of infection	Efficiency	Japanese stages of Gastritis
1	20	Indian	AS & TR	Good both	Chloroparaphysia of legs
2	21	Chinese	AS & TR	Good	Tenaculum
3	21	Indian	TR	Good	Ascaris both
4	21	Chinese	AS & TR	Good	Infestation of legs
5	21	Chinese	TR	Good	Both of legs

Notes.—Tuberculous.—In only one case (25) was there tuberculous which occurred the first day twelve hours after the first dose. In a few cases there was cancer after the first dose which developed after repeating dose.

*Key.—AS—Ascaris. TR—Tenaculum. ANC—Anchylomonas. ENT—ENT. Polysporous tuberculous.

Table 3.—**CLINICAL GROUP AND AGE GROUP OF PATIENTS (1) IN STUDY IN TABLE 2**

Below group	Under 30	30-39	40-49	50-59	60-69	Over 69	Total
Infants	2	1	2*	0	1	0	6†
Children	0	1	1	1	0	0	3
Adoles.	0	1	0	2*	0	0	3
Adults	0	0	1	0	0	0	1
Total	2	3	4	2	1	0	12

*Includes the 2 patients who were given two courses of treatment.

Table 4B.—**PATIENTS' DEMOGRAPHICS, IN CLINICAL GROUP AND AGE GROUP, BY SEX**

Age	Under 30	30-39	40-49	50-59	60-69	Over 69	Total
Female	2	0	0	2	1	0	5
Male	0	3	4	0	0	0	7
Total	2	3	4	2	1	0	12

Table IV.—**NO. OF PATIENTS' DENTAL EXAMINATIONS WITH DENTAL OR ORAL INFECTIONS, DURING THERAPEUTIC AND AGG. CLINICAL**

	Under 30	30-39	40-49	50-59	60-69	Over 69	Total
No. of patients with single infection	1	1	2	2	0	1	7
No. of patients with double infection	1	2*	4	4	2	0	14
No. of patients with triple infection	0	1*	0	1*	0	0	2

*Cases Nos. 1 and 2 had AG & TR, and Nos. 10 and 11 had TR.

†Cases Nos. 10 had *Staphylococcus aureus* and TR infections.Table V.—**EFFECTIVENESS OF SULFAMIDAZOLE THERAPY IN THE TREATMENT OF DENTAL OR ORAL INFECTIONS IN THE CLINICAL GROUP**

		Amoxicillin		Sulfamidazole	
	Total dosage	No. of cases	No. of cures	No. of cases	No. of cures
500 mg. i.d. for 10 days	5.0 g.	2	2—100%	0	0—0%
500 mg. i.d. for 10 days	5.0 g.	2	2—100%	5	4—80%
500 mg. i.d. for 7 days	3.5 g.	3	3—100%	0	0—0%
500 mg. i.d. for 10 days	5.0 g.	4	3—75%	5	4—80%
500 mg. i.d. for 10 days	5.0 g.	4	4—100%	0	0—0%
500 mg. i.d. for 10 days	5.0 g.	2	2—100%	5	5—100%

Discussion

Oral therapy for *Amoxicillin* and *Trabekuron* as single or mixed infections is increasingly effective as the total dosage increases as shown in the clinical trial. Larger total dosage over longer periods does not appear to influence effectively. Thus as the drug is fully absorbed, the feature of heavy drug concentration acting for a shorter period is the method of choice.

The effect concentration of excellent tolerance by the tablet method of potassium favors short period high dosage therapy.

7. Trial of a Fast Antelmintic Dibenzolene (Pflav) Brand of Dibenzolene

It was noted by ward and laboratory staff that in the short-period history-dosage course, the patients really sick after treatment commenced continued vomiting of partially digested tablets. It is highly likely that the enteric-coating envelope substance for some patients is too resistant to solution and breakdown in these cases.

The optimum dosage was found to be 300 mg. i.i.d. for one day.

In this trial Trichinosis-infected patients were noted to be slightly more responsive to therapy with Dibenzolene compared to *Ascariasis* infected cases in high total dosage over a longer period, and equally responsive in both instances to the higher short-period dosage therapy.

Conclusions

Dibenzolene has been used effectively as an antelmintic for Trichinosis and Ascariasis. The capsule presentation of the first trial has been substituted in the present trial by enteric-coated tablets of 100 mg. Dibenzolene (Pflav) brand of Dibenzolene. The earlier recommendation that the tablets be made available in larger doses is again repeated. An additional suggestion is made for the production of the tablet with an alternative lesser degree of enteric film coating.

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THE BASIC PRINCIPLES OF TROPICAL CLIMATOLOGY AND DISEASES DUE TO HEAT

BY

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Without studying Tropical Medicine in detail it is essential to have some understanding about the climatic environment in which Tropical Diseases are found and which it is important in the aetiology of nearly all these diseases. It is instructive to consider three main subjects—firstly the climatic of the Tropics, and factors causing differing climates in different parts of the Tropics, secondly the effects of these climates on the physiology of man and adaptation to them, thirdly the diseases caused by the physical effects of these climates, when adaptation has not become complete.

Tropical Climatology

As regards climate in the Tropics, it is as well to describe these briefly and then to consider in more detail some of the factors which are responsible for the presence of a particular climate in a particular place.

Historic classifications of climate do exist—one well-known classification has 15 different world climates—but it will be enough to consider three main types of Tropical Climate and some of the many factors which may influence them. These three types are as follows. The Wet Tropical Climate, The Dry Tropical Climate and the Desert and Semi-Arid Climate. If one starts at the equator (Map 1) very roughly speaking, the Wet Tropical Climate extends to latitudes 30° N. and 30° S. The Dry Tropical Climate lies to the north and south of the Wet Tropical zone and the Desert and Semi-Arid areas north and south of the Dry Tropical zone.

The Wet Tropical Climate characterizes such places as Northern South America, Equatorial Africa, Malaya and the East Indies. This climate is predominantly wet and warm. The humidity is often as high as 90 per cent and the temperature about 90° F. Extremely high temperatures are not experienced and the nocturnal fall of temperature is slight, rarely exceeding 10° F. Seasonal fluctuations are small. In the Service it will be experienced at Singapore.

The Dry Tropical Climate characterizes such countries as Central South America, Central Africa, the West Indies, East Africa, India, S.E. Asia, and Northern Australia. This climate is characterized by alternating seasons of



MAP. 1.

■ WET TROPICAL CLIMATE
 ▨ DRY TROPICAL CLIMATE
 ▤ GREAT & SEMI-ARID CLIMATE



MAP 2

PERMANENT WINDS - JANUARY

of Indonesia are also not true for general since the whole system of winds and rains moves to their north and the N.E. Monsoon is replaced by the S.W. Monsoon in the Indian Ocean; the N.W. Monsoon is replaced by the S.E. Monsoon in the S.W. Indian and the N.E. Trade is replaced by the S.E. Monsoon in the China Sea.

drought and heavy rainfall. It is really a climate which fluctuates between wet tropical conditions and semi-arid conditions. During a prolonged dry season extremely high temperatures develop, whereas in a long wet season the temperatures fall and the humidity rises, to approximate those of the Wet Tropical Climate. One will experience this climate in the West Indian Islands and the new zone at Mauritius. Hong Kong is on the northern fringe of this zone.

The Desert and Semi-Arid Climate characterizes such places as Morocco and Persia, Northern Africa and South West Africa, Arabia, Persia and Southern Russia, Western China and Central Australia. This climate is extremely hot and dry. The temperature may reach more than 115°F . at noon although it rarely exceeds 125°F . The nights are cool or even cold in comparison and the humidity is low—about 10 per cent. These conditions prevail throughout the year with extremely little, if any, seasonal variation. It will be most likely so that these conditions, temporarily in passage through the Suez Canal, the Red Sea and culminating at Aden and, rather more permanently, in the Persian Gulf.

Climate may be defined as the combined effects of the sun, the atmosphere and the earth at any one place.

The sun produces its influence by heat (and light).

The atmospheric effects are due to boundary processes and winds.

The earth is responsible for influences due to ocean currents, the relative proportion of land and sea, latitude, altitude and the extent of land masses.

These influences combine to determine the position of the Heat Equator (Map 1) which approximates the line of maximal mean annual temperature. This lies for the world part considerably south of the geographical equator. In Central America and Mexico it bends northward to a latitude of approximately 25°N . and in part of Africa it lies at 20°N . In the East Indies it lies at about 10°N . and for the remainder lies roughly 10°N . of the geographical equator. These facts demonstrate that the reason for the three types of Tropical Climate are not determined simply by the distance north or south of the geographical equator. This is where edge factors come into play.

One of the most important factors is that of the winds and in currents, especially the cold ones (Map 1). For instance, the Peru current is probably responsible for the extreme northward position of the heat equator in Central America and Mexico. The same thing happens in Africa where another cold current pushes the heat equator northwards again. The West Australian current tends to push the heat equator northwards through Southern India, and more cold currents from the Bering Sea push it south through the East Indies. The California current keeps the heat equator at the level of the geographical equator and just before it reaches the American coast once more.

The different effects of land and sea are best illustrated by the fact that the sun warms the atmosphere directly to a small extent only. The air is warmed mainly by dark heat radiated from land and sea. Sea, because it is fluid, does not warm up so anything like the extent that the land does and therefore the hottest climate, all other things being equal, will occur in the centre of large

areas of land where the lowest temperatures will be found at islands surrounded by large areas of sea—hence the effect of tropical islands and the extreme heat of the deserts of Northern Africa, Arabia, Burma, Central Asia and Central Australia (Map 1).

The temperature of a locality shows daily and annual periodic variations as earlier have slight. The greatest variation is due to the sun's rays falling on dry earth and heating it, and so it is more marked in the hot dry desert climates and minimal at sea. In warm moist climates an intermediate position exists. The annual variation depends largely on the inclination of the earth's axis, as it passes round the sun. At the Spring Equinox (21st March) the sun shines vertically on the equator at noon, after which the northern hemisphere becomes inclined more and more towards the sun, until about 22nd June, when it is vertical over the Tropic of Cancer at noon (17° N). At the Autumn Equinox (21st August) vertical over the equator, after which the northern hemisphere inclines away from the sun until about 22nd December. It is then vertical over the Tropic of Capricorn (23° S). Hence the sun is vertical over any one place between the two Tropics at noon twice a year.

Temperatures also varies vertically with altitude. On the average for every 500 ft. one goes up, the temperature decreases by 1° F. Other factors however are involved, such as the expansion of air (as when heated air expands the energy represented by heat is converted into motion), condensation of aqueous vapour which producing clouds retains heat radiated from the earth, the increased amount of earth rocks in low land being radiated into the air, and lastly the effects of winds depends on whether they blow from a hot or cold source. However, the general rule goes fairly good for most areas and we can assume that although the low countries of a particular country may have a typically tropical climate, the conditions in the high country will be quite different. The highest altitudes of Mount Kenya, which lies on the equator, are perpetually covered in snow, and the Cameroon Highlands, in the midst of Malaya, have a very pleasant climate indeed. The mountain climate has been explained from the law of Tropical Climates as it occurs outside the Tropical Zone as well as inside.

Another important factor which influences the particular type of climate one will find in a place is the pressure of the atmosphere. At any given place this depends largely on the temperature of the air. Apart from the effect of atmospheric pressure on the oxygen concentration, which is so important in Avian and Mammalian and Underwater Physiology, variations in barometric pressure cause winds which have a very special influence on any particular climate. They can be divided into Permanent, Periodical, Local and Variable winds.

Permanent winds are trade winds and include the North East Monsoon which is steadily track-downed. Generally speaking a high barometric pressure is recorded at sea level about 30° N and S of the equator. The high pressure decreases towards the equator because of the heating of the air and, at the equator, the hot air expands with considerable force to very high altitudes.

Though the pressure at 30° is higher than that at the equator at sea level, it is considerably less at higher altitudes. As a result, air passing upwards from sea level at the equator into higher altitudes will then flow rather north at such towards 30° (Fig. 1). As these currents flow polewards they are compressed and

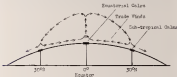


FIG. 1.—Section of the earth showing the formation of the Permanent Winds and Cells.

forced downwards by increasing pressure mainly due to the cooling of the air and much sea level at 30° N. or S. causing the rise of high pressure around the earth that have already been noted. Where these currents of air reach the latitude of 30° N. or S. they travel mainly towards the equator. The remainder travel poleward. From these facts one can explain the equatorial cells, where the air is ascending vertically, the subtropical cells or cells where it is descending vertically and dividing into N. and S. moving surface currents. Between the latitudes 30° N. and 30° S. one therefore finds the N.E. Trades and N.E. Monsoon, and the S.E. Trades. The northerly or southerly direction of these winds is due to the fact that have already been mentioned and the westerly direction is due to the rotation of the earth. These winds are not universal—they are only to be seen typically over the ocean, where the temperature is equable and there are no local conditions to divert them from their course. The temperature of the atmosphere as has already been seen is not of the factors that determine the barometric pressure and consequently, the permanent winds. As a result, the trade-winds together with the calms north and south of them shift their position according to the temperature. During the summer months they advance northwards and in winter recede southwards. The tropical rains as will be seen later, depend largely on this movement, which is itself dependent upon the inclination of the axis of the earth towards the sun.

Periodical winds are known as Monsoons and are characterized by the North-East and South-West Monsoons of the Indian Ocean. They are due to the heating of large tracts of land in one time of the year and not in another.

The heating of the plains of Asia during the months of May to August causes the air to heat vertically, just as it does at the equator. The S.E. Trade, which is blowing south of the equator, is drawn up towards and deflected into westerly direction, to fill the depression thus, forming the S.W. Monsoon. The N.E. Monsoon is, as has been already noted, really a trade-wind. The same principles apply to the N.W. and S.E. Monsoons. The N.W. Monsoon is probably mainly due to the heating of the Australian desert, which causes the N.E. Trade, blowing north of the equator, to be drawn southwards and deflected as an easterly direction. The S.E. Monsoon is like the N.E. Monsoon, mainly a trade wind, but on this side the monsoon is controlled across the equator by the pull exerted by the hot Asian plains.

Local winds are of great importance in Tropical Climates. The most important are due to the warming of the land during the day giving rise to the heated air-rising, forming and on cooling at night and a subsequent dry air-slowly falling. These vary immensely according to the amount of cloud-amount, which in turn determines the amount of terrestrial and solar radiation. The cool, dry, all-charge wind is dangerous in so far as it causes manna from and abruptly cools the body.

Variable tropical winds occur in the equatorial and sub-tropical regions of rain.

Little is said of two about humidity and rainfall. Man can bear very high temperatures easily so long as the air is dry. If the humidity is also high, loss of excess heat by evaporation of water is reduced and dangerous conditions prevail. Thus humidity is of the greatest importance. It is of course, due to insipidation from the surface of all collections of water, the sea, rivers, lakes and even land when this is wet. The capacity of the air to hold water in suspension is doubled for every 32° F. rise in temperature. Therefore the greatest humidity exists in the wet tropical climate, which combines a high temperature and a source of water for evaporation. Aquatic vapour rises as cold air rises and condenses to form dew, fog, morning clouds. When the water droplets become too large and heavy to remain suspended they fall as rain, hail or snow. Rapid evaporation causes a considerable amount of heat to be made latent and this heat illustrates the value of collections of water in keeping the temperature equable. By wrapping wet flannel or flannel round a bottle of beer and exposing it to the breeze on an artificial breeze from a fan one can enjoy quite a cool drink even in the hottest climate, provided that the air is not saturated.

The rainfall in a locality is determined by its position relative to the equator. At the equator the heated air is full of aqueous vapour brought by the trade-winds from the sea. This rises to high cool strata, and condenses to form cloud and rain. Now, the whole system of trade winds and rains moves north and south depending on the season of the year, as has been already noted, and so also does the rain-belt which results from the combined effects of the trade-winds and the temperature. It and shows two lines (A, in fig. 3) north and south of the equator to represent the boundaries of the rain-belt at the time of the two Equinoxes, when the sun is vertically over the equator, and has drawn two



FIG. 2.—Zones of rainfall

further lines (B) for the same can belt at the zone of mid-summer and two more (C) for mid-winter, in the Northern Hemisphere. There are therefore three zones on both sides of the equator whose east will export differing results. In the Northern Hemisphere in the first zone, which is between the equator and 10-15° N, the N.E. Trades will be blowing in March and the sun will be vertical, it will therefore be raining. This wet season will be followed by a period of calm and dry weather. In September the S.E. Trades will be blowing the sun will again be vertical and it will again be raining. This will again be followed by a period of calm dry weather. So there are two short wet seasons and two short dry seasons. In Zone 2 between 10-15° N and 20° N the conditions are basically the same but the dates when the sun is vertical are so closely separated that the rainy seasons merge one into the other so that there is a long wet season in the summer and a long dry season in the winter. In Zone 3 between the outer limits of the con-belt between 20° and 30° N, the sun is only approximately vertical once a year and so there is only a short rainy season of three to four months. The rest of the year will be dry. Beyond Zone 3 the conditions will be amongst the driest in the world with rain, if any, due to the extension equatorially of the Polar winds. The zones of rainfall coincide with the zones of the three Tropical Climates that were mentioned in the beginning. Zone 1 coincides with the Wet Tropical Climate. Zone 2 with the Dry Tropical Climate and Zone 3 with the Semi Arid Climate. The zones are of course, only approximate, numerous exceptions and intermediate conditions exist. The Monsoons radically alter their conditions in the Indian Ocean, China and Northern Australia. The S.W. Monsoon is responsible for any rain falling in

Southern India and Hawaii. The N.W. Monsoon brings rain in the eastern North of Australia. The S.E. Monsoon brings rain to India and S.E. Asia.

ADAPTATION

Adaptation to any particular climatic condition implies an ability on the part of the body to maintain a normal body temperature. This depends on the power to balance heat gain with heat loss. Heat is gained from external body metabolism or internal sources. Heat gained from without the body is by radiation, conduction and convection, e.g. by radiant heat from electric fires, conducted heat from hot-water heating and convected heat from warmed air currents. Radiant heat is gained from the sun. The earth and any hot air objects in the immediate environment, such as the steel plating of ships, conducted heat is gained from warm air currents electric stoves to radiators and convected heat warming the air, conducted heat is a less important factor unless one is foolish enough to lie on the hot deck, like the ancient mariner.

Heat is lost by radiation from the skin to cooler objects, by conduction from the skin to cooler contacts, by convection from the surface of the skin to cooler currents and, lastly, by evaporation of water from the skin and water from the lungs. In desert climates it is said that one meets up with cooler objects, common air currents. In fact the reverse is often true and heat is not only gained in this way. The most important mechanism of heat loss is therefore evaporation. For each gramme of water evaporated one loses just over $\frac{1}{2}$ a calorie of heat. In warm moist climates however evaporation is hindered or even prevented by the high humidity and heat is lost mainly by radiation, conduction and convection. In these circumstances heat loss may be hindered or even gained if excess clothing is worn. In addition to reducing heat loss by radiation, conduction and convection, condensation and absorption of moisture by the clothing will result in the retention of heat.

The response of the body to heat must be an attempt to maintain a heat balance. This is achieved by peripheral vasodilatation, increased mucous volume of respiration, hyperaemia of sweat and by a reduction of basal metabolism. In addition, less heat is produced by an inability to perform continuous heavy work without distress and, in extreme cases, by fatigue. However changes induced in the nervous system cause the subject, as distaste disappears and he becomes acclimatized or physiologically adapted to the new environment. This process involves a reduction in the reacting threshold, a diminution in the salt content of the sweat and haemoconcentration. These changes are said to occur more readily in middle life. It is probably true to say that the elderly are less able to regulate their body temperature because of the comparative inefficiency of their regulatory system, which is essential to age. But it is doubtful whether this is true of children, although it has long been accepted as so. In all Tropical Climates children seem to do well provided that tropical hygiene is practiced.

Apart from physiological adaptation, environmental adaptation is of great importance. The factors involved range from the use of suitable clothing to air conditioning of ships and buildings. The correct procedure will, of course, be

different in different climate conditions. In the desert and semi-arid climate it is important to limit heat gain from radiation, convection and convection and to aid heat loss through evaporation. Clothing should therefore be white to reflect radiation and loose and porous to reduce convection and aid evaporation. Sweat, but not heat, will amount to a liter or so and, as well as water, salt will be required to replace it. The night may be cool or even cold and warmer clothing may then be required. Needless to say, rest should be taken in the shade during the day and as much of one's work and travelling should be done as might be possible. In wet climates there is no need to protect the body against heat gain and therefore clothing is not required for this purpose. The only necessity for clothing, medically, is for the protection of the unwork material skin from the burning rays of the sun, otherwise the less one wears the more will be the heat loss by all means. So far as adaptation of the skin itself is concerned, this is a gradual and relatively prolonged process necessitating only short exposures daily until adaptation is as complete as possible.

DISORDERS DUE TO HEAT

Diseases due to heat result either from a failure to adapt oneself physiologically or failure to adapt one's environment.

The effects of heat due to the infrared rays may be mild or severe. Two main types of general illness are recognized (Table 1) although there are numerous borderline cases which fall into neither of these categories. Heat exhaustion is characterized by prostration and circulatory failure associated with little, if any, rise of body temperature. Under identical conditions heat exhaustion may develop in one person and heat hyperpyrexia in another. In addition, heat exhaustion may develop into heat hyperpyrexia if treatment is not adequate. Chronic circulatory disorders, debilitating diseases, exposure, age and old age, predispose to heat exhaustion, heat hyperpyrexia occurs in healthy and younger persons.

In heat exhaustion symptoms usually develop rapidly and include weakness, nausea, headache and prostration. Syncope can occur. The temperature may reach 102° F. but is more often normal or subnormal. The signs are those of circulatory failure and include a few S.P. weak rapid pulse, pallor and a clammy skin. Treatment is mainly symptomatic. Clothing should be loosened and the patient should be given in a shady place where there is a free circulation of air draughts, however, should be avoided. If the temperature is subnormal, the patient should be wrapped loosely in blankets and hot water bottles applied to the feet. Cardiac stimulants may be needed but this is unlikely and most patients recover with rest alone. Diagnosis is usually easy.

Heat hyperpyrexia or heatstroke is characterized by very high fever and associated symptoms. Circulatory collapse and coma may develop in the later stages. Symptoms usually develop slowly, beginning with sensation of burning as much as forty eight hours before the onset of the attack. Mild prodromal symptoms, which may pass unnoticed, include headache, weakness, headache, vertigo, photophobia and pronounced thirst. At this stage there is a slight

TABLE I

Prognostic signs	At or before death (respiratory disorders)	After death (circulatory disorders)
Death	Defibrillating device Finger Olf. apt.	Brain checked
Respiratory		
Early	Weakness Hemibolic Spasms	Stupor Goldenrod
Intermediate		Labored Pne. pulse 1-2 breaths
Late	Collapse	Weakness Convulsions Death
Body temperature		
Early	Under 100°	Normal
Late	Below normal	100° or over
Agitation		
Early	Circulatory failure Low R.P. Weak and rapid Pulse Pallor Clonus	Typhoid Stupor 100° or over Depression of urinary chloride Increased C.P.T. Pulse's
Late	Circulatory collapse	Circulatory and mental failure No. 4 irregular pulse Pupils contracted Reflexes diminished Coma Clonus Pulmonary congestion Clonus Rapid breathing
Discharge		
Respiratory	Hot Apnoeic	Hot Apnoeic
Systemic		
Early		Spasms, delirium—red and blue Rapid respiration Rapid body temperature Hot Rapid and weak Circulation Circulatory and Central failure Consciousness Lungs Pupils 10° or over—contracted
Complications		
Prognosis	Good Good	Good Good

system and tachycardia. About forty-eight hours after cessation of sweating there is a sudden sharp rise of temperature which may reach 100° or even higher. This may be accompanied by delirium or coma. Convulsions and vomiting are common, diaphoretic complications. The pupils are contracted and the knee jerks and pupillary reflexes are usually diminished or abolished. The pulse which was at first rapid, becomes weak and irregular. Cyanosis and clamminess of the skin together with Cheyne-Stokes breathing are late and dangerous signs. Anasarca and a collection of urinary chlorides are important signs. The spinal fluid is under increased pressure and consequently is scant. However, prostatic retention and strabismic disorders may be present, with a consequent depletion of chlorides and the development of heat, orange. In untreated cases death supervenes very quickly indeed. A person attacked during the night may be found dead in the morning.

Complications include bronchopneumonia resulting from pulmonary congestion and edema are common.

Treatment must be quick, reliable, efficient, and safe. The aim is to cool the patient, and reduce his temperature, replace lost fluid and correct any cardiac or respiratory failure. It may also be necessary to control convulsions. The patient should be placed in a recumbent position in the coolest available place, where there is free circulation of fresh air. He should also be stripped. The temperature is reduced by sponging with tepid water accompanied by rubbing friction to the skin and continuous fanning of the patient. He can, with advantage, be strapped up in a wet sheet which is sprayed with water as droplets evaporate and perpetually exposed to fanning. The rectal temperature should be taken every five minutes and cooling treatment stopped when the temperature reaches 103° F. The patient should then be wrapped in a light dry blanket. The temperature should continue to fall for a time even though treatment has been discontinued. In cases where hyperpyrexia has not developed, run in a cool dry place, cool baths and plenty of cool fluids to drink are all that will be required. A close watch is however essential until symptoms have almost abated. In severe cases of dehydration fluid will have to be given parenterally—normal saline or 5 per cent dextrose should be given by continuous intravenous drip. Although the mechanism of the circulatory disorders of the condition are not well understood, certain treatments may be required in cases of pulmonary congestion. Ventilation may even be necessary. Light narcotics has been used to control convulsions and barbiturate in sometimes indicated to reduce a raised intracranial pressure. The only other important factor to be borne in mind is that heat exhaustion may simulate uraemia and may vary. If there is any doubt about this, emergency quinine is imperative.

Investigations, although important, should be performed only when danger of death from hyperthermia has been prevented. These investigations, besides the examination of blood films for malarial should, in a severe case, include the following:

- (1) Examination of the blood to exclude malaria
- (2) Examination of the urine to exclude diabetic coma and make fair (red blood cells) and to demonstrate albumin and absence of chlorides
- (3) Examination of the C & P for any signs of meningitis and the determination of a renal pressure

The power to sweat may remain absent for as long as three weeks after recovery. Headache, photophobia and problems may continue for a week or so. These facts are indications for continued caution and persons should be protected as far as possible from exposure to heat during convalescence. Even after complete recovery persons who have suffered even mildly from heat hyperpyrexia may remain abnormally susceptible to heat for many years.

HEAT CHAMPS

Heat cramps are exactly the same as cramp's cramps and stiffness cramps and are due to salt depletion. Treatment consists of rest and replacement of salt and fluid in severe cases by intravenous infusion. Heat cramps should be prevented by the intake of additional salt usually in tablet form.

SUNBURN

Sunburn is, of course, well known to us even in this country. The red, and often worse, rays of a strong sunburn is stinging, weals and areas of disfigurement by cloud or reflected by a bright surface. It is not essential to be in the direct rays of the sun. Penetration of the skin protection from sunburn as does rays have very little power of penetration. Sunburn may vary from a simple hyperaemia to second or, possibly, third degree burns. It may cause mild heat pyrexia with malaise, headache, fever and vomiting. It may also interfere with vasomotor control and sweating.

TROPICAL HEAD (MAMMILLARIA)

Practically just one of the commonest and most important causes of a headache and loss of working hours in the tropics. It is confined to the palmated nasal root and is probably due to the hyperaemia of the cerebral. The intense itching is accompanied by a fine, subcutaneous, vesicular rash and is predisposed to by exertion and friction. This is followed by cessation of sweating which may give rise to weakness and exhaustion, if the area involved is large. The aetiology is said to be the formation of a keratin ring around the orifices of the sweat ducts combined with the drying of the epidermis. These conditions are produced by a combination of excessive sweating and factors which deplete the skin of its natural fatty secretions. These latter include frequent washing with soap and water and the use of powders and astringent sprays including sweat repellents. Treatment is aimed at the avoidance of predisposing factors and the application of creams.

TROPICAL ORZEL

This is a very common symptom in the tropics. In addition to the conditions which cause the complaint as hyperaemia, acute, nutritional causes and tropical diseases, orzels commonly results from purely physiological causes. Head orzels is said to be due to the disturbance in vasomotor control during acclimatization. It occurs in the subconjunctiva, especially the whites and vessels, and is usually transient, requiring no treatment.

ACKNOWLEDGEMENTS

I would like to thank Surgeon Captain Stanley Miles M.D., M.B., D.T.M.&H., Royal Navy, for his criticism and advice, and Surgeon Captain J. L. S. Graham, D.F.C.—P.R.C.S. Eng., L.R.C.P. (Barister at Law), R.N., for his encouragement and permission to publish this article.

Clinical Notes and Cases

NOTE ON A CASE OF CORONARY THROMBOSIS AT AN UNUSUALLY EARLY AGE

25

Surgeon-Commander F. H. LAMB, R.N.

The following case is thought to be of interest because the man was an extremely tall and strikingly Maori of only 37 years of age. He had no relevant past history, and had not reported sick on all more than one and a half months before he died on September 1928.

He collapsed, according to eyewitness accounts, about twenty minutes after the start of an easy ten M football match on 1st August 1928. At the time he was preparing to drive on to a bus but he had raised the ball to about chest level when he suddenly dropped, a groan being then and collapsed. He could not speak, was fighting for breath.

Failed in attempts, but not, according to the observer, that the man went around upwards. He lay on the ground in the early stages seems to have been breathing approaching apnoea. In a very short time he went blue and pale, and it is presumed that this is when death took place.

By order of the Command a post-mortem examination was carried out by Dr V. H. Bowers, the Consulting Pathologist for the South-East Area Hospital Management Committee. It was carried out after examination.

During examination of the heart a patch of infarction was found in the right circumflex artery. Infarction to the patch was a blood clot, and another clot was found further down the artery though it was not certain whether this was true or whether it had been detached by the point of the incision when opening the vessel. In the posterior wall of the right ventricle there were small foci of yellowish discoloration apparently representing the very earliest stages of atheroma. The rest of the heart muscle, the valves and the major blood vessels were perfectly healthy. No other abnormalities were found during the post-mortem except various trivial singularities in the blood-staining organs.

One would not expect a small artery to result from such a prolonged thrombus in so large a vessel. It is presumed that acute fibrillation set in leading to cardiac failure.

I am indebted to Dr V. H. Bowers for permission to use the information he obtained during the post-mortem examination, and to the Command Medical Officer, Surgeon Rear-Admiral W. R. S. Packeridge, Q.H.P., for authority to publish.

AN UNUSUAL CASE OF DECOMPRESSION URTICARIA

BY

Sergeant Lieutenant W. M. HOLLYHOCK, R.N.

It is an era when the members of compressed air teams held responsible for occasional allergic manifestations is ever-increasing, the following case is submitted as presenting some rather unusual features. It occurred during the routine escape training given to all new entry submariners.

At 1400 on 1st March, 1958 Able Seaman J. aged 23, surfaced on completion of a fifteen feet escape tank trial. He had completed a 20-foot ascent that tried what most successfully and had done two ascents in the forenoon, one from 15 feet and one from 20 feet. He had been "blasted up" in the tank for a further 20 foot ascent in the forenoon but this had to be cancelled because another trainee experienced difficulty in climbing his own.

About a minute and a half after leaving the water he noticed two unusual wheals, about 1 cm. in diameter on the right hypochondrium, some 5 cm. from the umbilicus. These wheals were surrounded by signs of erythema approximately 1 cm. in diameter. There was no edema or pain and he lay out into the tank, the patient would have been unaware of their presence.

Against the sudden news of the two wheals (producing further more marked signs of decompression illness) immediate recompression to the chamber was decided upon. After compression to 120 feet it was estimated should see further symptoms develop, to surface the patient with oxygen mask and stop at 50 feet. During the ascent to 50 feet however he developed further wheals scattered patches over the arms and shoulders. Discomfort in the legs prevented the greatest difficulty. The development of further lesions during decompression suggested "skin bends" but the chest showed no evidence primary or mixed apnoea (this "rescue" it was felt that the safest procedure was to recompress the man. This was done to a depth of 200 feet, and he was then brought to the surface with the following "stages"

- (i) 20 fpm—15 minutes (preheated to permit through exhalation)
- (ii) 50 fpm—5 minutes
- (iii) 20 fpm—5 minutes
- (iv) 20 fpm—25 minutes

Clinical Examination During Decompression

At 50 fpm C.M.B. and chest—M.A.B. Further scattered patches had now appeared. Marfan's dermatographism.

At 20 fpm For the first time noted onset of the rash became intense especially over the shoulders.

At 50 fpm Thorough re-examination of the central service system, chest and cardio-respiratory system showed no abnormalities. Fresh oxygen. Pump 15 per minute. Blood pressure 125/75. At this stage the appearance of the lesions was unchanged but the erythema became intense.

At 20 fpm After ten minutes of the "stop" the erythema had faded considerably and the wheals were greatly improved.

Half an hour after leaving the recompression chamber the rash had almost completely faded and the patient had subsided altogether.

The patient was kept under observation for a further twenty four hours but no other signs or symptoms developed.

Thorough autopsy, with prosection performed and lavage finding failed to reveal any evidence of previous allergic manifestations, either local or general. At this stage the diagnosis seemed to rest between the following possibilities:

(1) *Allergic Sensitivity to Chlorine*

This seemed most unlikely, as the test agent was an chlorinated patch without ill effect. (The water in the Swimming Tank is chlorinated to have a residual of 1.5 p.p.m.)

(2) *Allergic Sensitivity to Nitrogen*

The length of time under pressure was so short (a few minutes only) as to render this unlikely, but the occurrence of itching as a common symptom of chloroacetylene sulfides is reported [4] and it is quoted as being one of the serious manifestations [5] of this compound.

(3) *Sensitivity to the Fabric of the Suit*

In view of the fact that the distribution of the lesions corresponded approximately to the area covered by the life-jacket web and belt, this appeared to be a very likely diagnosis. The web is made of the normal orange rubber on a fabric base. The belt is all the usual thin webbing type.

Against this possibility is the fact that the patient had used the life-jacket for two months during the summer without ill effect. It can also be mentioned that the control responder (Swain) had not produced any marked dermographism.

(4) *Idiosyncratic Chlorine*

The localized nature of the lesions, without any local or other lesions, suggests that this possibility may be excluded.

Re-sensitivity Tests

In view of the differential diagnosis given above, it was felt that patch tests should be carried out with the life-jacket fabric, to establish or exclude this as the most likely allergen to nitrogen in causing the symptoms.

All patches were made up with pieces of about 4 sq. cm. size, centrally mounted on 3-in. gauge squares and applied to the skin of the back. The gauge squares were secured with plaster strapping, which produced no reaction of itself.

The following patches were set up:

- (1) Blue webbing from the belt
- (2) Rubberized fabric from the side fabric to skin
- (3) Rubberized fabric from the side rubber to skin
- (4) Dressing powder, obtained from a newly unpacked tin
- (5) Plain gauze as a control

After twenty-four hours, there was no reaction to any patch, so all the gauge pads were washed in chlorinated water from the tank and a further control, using ordinary tap water set up. As there was still no reaction twenty-four hours later, the pads were soaked again.

Four days after setting up the patch tests, there was still no reaction of any kind. Having regard to the conditions of the test, a firm negative conclusion seems reasonable.

CONCLUSIONS

In view of the negative result of the patch test, the most likely diagnosis would seem to be one of abnormal sensitivity to nitrogen under pressure, possibly aggravated by physical exertion of the lifejacket. In spite of the comparatively short time under pressure, there seems to be nothing to contradict the statement that this was an allergic reaction to a small dose of the irritant.

The possibility of trying to reproduce the symptoms by injecting small quantities of air subcutaneously, using helium as a control, and vulgating the patient to further compression, was considered. Such a procedure did not seem practicable.

ACKNOWLEDGMENT

I am grateful to Surgeon Captain W. J. Forbes-Guild, R. N. for permission to publish this article.

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- [1] MILLS, S. (1955) *J. roy. nav. med. Soc.* 51, 77-80.
- [2] Royal Naval Medical School (1955-6).

THE ROYAL NAVY MEDICAL CLUB ANNUAL DINNER, 1960

The Annual Dinner of the Royal Navy Medical Club was held in the Pacific Hall of the Royal Naval College, Greenwich, on Friday 26th April, 1960. Surgeon Vice-Admiral Sir Cyril May presided, and the following Guests and Members were present:

As Hosts: The Lord Lewis, D.C.F.D., The Earl Cawley and Viscount Callaghan, D.C.F.D., Sir James Peckham, K.C., B., A.C.F.D., F.R.C.S., Sir John Pickens, Sir Patrick Lee, Prince A.R.C., Sir John Kocourek, R.C.F., Sir Neilson Macdon, D.C.F.D., The Viscountess Archibald, J. Armstrong, D.S.C., D.H.C., Chaplain of the Fleet, The Right Reverend Monaghan, F.R.C., Surgeon Rear-Admiral W. P. Birch, D.S.C., Surgeon Rear-Admiral D.S.C. J. Peggins, C.B., Surgeon Rear-Admiral F. G. Hays, F.R.C.S.E., Surgeon Rear-Admiral W. P. E. McIntyre, Surgeon Rear-Admiral W. S. S. Pridemore, Surgeon Rear-Admiral S. G. Ransfield, C.B., Major-General H. Gordon, C.B., Air Vice-Marshal S. Surgeon, C.R.E., Air Commodore W. P. Stacey, C.B., Surgeon Captain W. H. Adkins, Surgeon Captain E. R. Alderson, Surgeon Captain F. W. Baskerville, Surgeon Captain S. P. Bealby, Surgeon Captain M. L. Clive, D.S.C., Surgeon Captain J. L. S. Coulter, D.S.C., Surgeon Captain T. G. S. Crawford, D.S.C., Surgeon Captain H. B. Gough, Surgeon Captain A. E. Flaherty, D.S.C., Surgeon Captain G. L. Fox, D.S.C., F.R.C., Surgeon Captain W. J. Forbes-Davie, Surgeon Captain D. P. Gledhill, Surgeon Captain M. S. Higgins, Surgeon Captain J. M. Holford, D.S.C., Surgeon Captain D.H. W. 140128, D.S.C., Surgeon Captain J. Johnston, Surgeon Captain C. Kington, C.B., Surgeon Captain R. S. Lewis, D.S.C., Surgeon Captain A. Long, Surgeon Captain J. G. Mayall, C.B.E., Surgeon Captain R. W. Martin, F.R.C., Surgeon Captain D.H. W. L. Mountain, D.S.C., Surgeon Captain C. Pearce, Surgeon Captain S. H. S. Price, Surgeon Captain E.H. A. W. S. Price, Surgeon Captain G. G. Vickers, Surgeon Captain R. W. Barnes, Surgeon Captain H. M. Widdowley, F.R.C., Air Commodore W. S. Kington, C.B.E., A.F.C., Captain M. L. Steele, D.S.C., Commander C. P. H. White, Major Professor G. P. Colver, D.S.C., Professor John Lumsden, Professor S. W. Reed, C.B.E., Professor A. W. Williams, Professor B. Wooding, F.R.C., Surgeon Commander G. A. Evans, Surgeon Commander W. A. Harris, Surgeon Commander G. G. Humphrey, D.S.C., Surgeon Commander W. B. Jones, Surgeon Commander W. M. Doreham, D.S.C., Surgeon Commander D.S. W. J. M. Farnham, Surgeon Commander T. W. Peggins, D.S.C., Surgeon Commander J. Glen, D.S.C., Surgeon Commander W. H. C. M. Harcourt, Surgeon Commander G. S. Hyde, Surgeon Commander S. G. P. Linton, M.D., Surgeon Commander C. L. T. McClintock, Surgeon Commander E. Reid, M.D., D.S.C., Surgeon Commander B. T. May, Surgeon Commander P. Mayall, Surgeon Commander P. O'Brien, Surgeon Commander S. J. G. Connor, Surgeon Commander J. S. Hughes, Surgeon Commander M. G. Scott, Surgeon Commander A. W. Robinson, Surgeon Commander J. P. Hays, Surgeon Commander D.H. W. E. Stables, Surgeon Commander T. A. Trenchard, Surgeon Commander L. O. H. Le. Ulick, Surgeon Commander B. Wilson, Surgeon Lieutenant A. T. Greenham, Surgeon Lieutenant J. B. Lumsden, Surgeon Captain W. E. Underhill, D.S.C., C. Archer, S. J. Atkinson, A. W. Ballin, M. H. Bland, A. J. W. Bond, D. Bell, H. Brown, A. Bingley, D.S.C., P. J. A. Bunker, P. G. B. Campbell, B. L. Conway, F. Conn, F. C. W. Cope, J. A. Cress, D. Crawford, G. Davies, W. P.

Officers were up to full strength so that there had been no necessity to draw on Retained Service Officers for the last three years. The career structure for both Specialist and non Specialist Officers was most satisfactory and a hopeful sign for the future was that there are waiting lists in both the Medical and Dental Branches for transfer to the Permanent List. The number of officers attaining higher degrees and qualifications had been most gratifying and included 1 F.R.C.S., 1 M.D., 1 M.Ch., 1 F.D.S. and 9 Diplomas of various kinds.

Congratulating Sir James Francis Ross upon his elevation to a knighthood, Sir Cyril expressed his gratitude to Sir James and to the Council of the Royal College of Surgeons of England for again permitting the Club to hold its Cocktail Party at the College.

After commending a number of Medical and Dental Officers who had received Honours and Awards, Sir Cyril announced the institution of the Fred Kildridge Prize valued at approximately £100 annually.

Ending on a personal note, Sir Cyril May expressed his sadness that the occasion was his last night in the Navy before his retirement. He wished to thank his Medical and Dental Officers of the Royal Navy and the Royal Naval Reserve, the members of the Nursing Services, the Civil Consultants and also his personal Staff in the Medical Department, for their support and co-operation during his term of office and he wished success to Surgeon Rear-Admiral W. R. S. Pankhurst who would be taking his place as Medical Director-General and who, Sir Cyril well knew, would receive from all quarters the unfailing help upon which Sir Cyril himself had always been able to count.

Reviews

A HISTORY OF DYSLEXIA OF THE EAR. By Herbert D. Maskey. P.B.C.N. 1, 1977. Pp. 174. D.P.H. (Dare Dale) L.M. P.B.T.A.M. South-Island. Pp. 253 with 56/3 in figures. Daphn. C. J. Fainta-Larant. Price is 50.

Although in the preface of this book the author states that it is intended primarily for students there are several points which in the reviewer's opinion, unfortunately make it unsuitable both for the undergraduate and the general practitioner hoping to widen his knowledge of the condition.

Firstly, an attempt has been made to deal with the necessary separate conditions. Very many of these described are so rare that it is more unlikely that the average student will come across them during the whole of his career. It seems far better that they should only be noted and described briefly.

The results of investigations, as shown in tables and diagrams. The problems of post writing photographs, all in black and white, would make the task of establishing a diagnosis very difficult for the student. Why for instance, would whole page photos on showing a "baked, varnished" story (pg. 25), Transcription of Gospels (pg. 25) or Papyrus Letter Photos (pgs. 24 and 25) when the only other features are the monotone and syllabics? There are also a few number of almost identical pictures of non-specific examinations routinely stated to be that in various places, post content, etc. etc.

Again, as a book of this type it can hardly help the student to include histological descriptions, or photomicrographs showing the cellular features of "fungi".

The book, therefore, as far as concerned, is far of use to the Undergraduate, but can suggest to most enough to be of value as a practical aid in the management of common eye diseases. The only really surprising feature is the quite remarkable price when compared the book in terms of all the services needed to it. A good buy for the medical officer who feels that the publisher cannot think to take a cut of the money better, but unfortunately much more expensive. Volume 10, 1977.

L. N. H. S.

HISTORY OF KERNAL AS APPLIED TO HUMAN BEINGS. By F. E. Kerk. C.M.C. M.S. P.B.C.S. P.B.A.C.S. and A. L. Walscott. M.S. P.B.C.S. P.B.A.C.S. Second Edition. Pp. 253 with 127 illustrations. Edinburgh and London: E. A. S. (Livingston) London. Price 50. Home postage is 50.

In the everyday activities of work and play few parts of the body are of more importance as in this case hands, and the parts of the body are more vulnerable to injury both at work and in the home.

An increasing realization of these facts has led to a great deal of work being done on the application of the principles of physics simply to the treatment of hand injuries. The authors unfortunately state that in the language of the World of the knowledge of a technique the value of which will continue to be reduced as it matures in application, and in having himself and Kerk Kerk elsewhere shows the possibility of a separate category of the hand.

Mr. Rank and Mr. Wiggall have in their new pre-booklet made by him, addition to his literature on the treatment of hand injuries. These are published under a thin miniature clinical background both in England and Australia and have drawn on their practical experience, as well as the book, meeting on the highest standards throughout and emphasis on the importance of good primary surgery in determining the eventual result. The authors believe of primary treatment is all that is should and can be, there is a last demanding need for secondary operative procedures and effective complications based on securing safety.

Although the emphasis is on primary treatment, chapters are included on secondary anatomy of the hand, manipulation and appraisal of a severely injured hand, the external and secondary treatment of hand injuries and the management of burns.

The book is clearly written and beautifully illustrated. It contains lessons for every person who has to deal with hand injuries.

J. W. W.

PRACTICAL ELECTROTHERAPY FOR PHYSIOTHERAPISTS. By Miss Brenda Savage, M.B., B.S.C.P. (Teacher's Certificate). Pp. 128 with 51 line drawings. London: Pitman and Peter Lane Ltd. Price 5s. 6d. net.

This book covers a wide and complex field of treatments by electrotherapy and will be invaluable to physiotherapists in the hands of the necessary details on the technique of application of the numerous treatments available. This should prove to be of more benefit to the qualified physiotherapist as it is his that constitutes emphasis has been placed on safety measures for the student physiotherapist. The chapters are numerous, clear and self-explanatory. This chapter on long-wave diathermy should prove a useful addition especially for new students and recently qualified physiotherapists.

CAPITAL THERAPY. By C. J. Polson, M.D.(Phys.), F.R.C.P., M.R.C.S. of the Royal Temple, Recorder at Law and R. N. Townsend, D.F.C., M.D.(Law), F.R.C.P. Pp. ix+201. London: English University Press. Price 45s. 6d. net.

Professor Polson and Dr. Townsend have here produced an outstanding work which is intended primarily to describe the clinical features of poisoning in the home. Historical poisoning and toxicological analysis are provided wherever possible. In the same way the scope of the volume has been restricted to the domestic poisoner in his or her life, and with recognition given to the importance of all practical importance. The various features are most clearly set out and clinical illustrations and case histories are a valuable explanatory feature.

The chapter on poisoning by means of the greatest interest and the interest for any did not realize the degree may be expected in the field of limiting water in the development of the nursing, the effects being proportional to the number of symptoms produced by the poison. Poisoning by barbiturates is adequately covered and a note being so comprehensive at the present time. Although this is a excellent work for which the authors merit our gratitude and congratulations.

J. L. S. C.

A SHORT HISTORY OF MEDICINE. By W. R. Rieu, M.R.C.S., L.R.C.P., F.R.S.L., F.R.A.S. Pp. 128 with 51 line drawings in the text. London: Pitman and Peter Lane Ltd. Price 12s. 6d.

I found this small book most interesting and I am sure that all nurses will enjoy reading it and learn much from it.

In the section on Q.A.R.N.M.S. I am very glad no mention was made of Mrs. Blackman who is in no way connected with the Nursing in 1920 to care for sick and wounded sailors on the Crimea.

Altogether a most readable book.

J. M. W.

Hypnotism in Psychiatry. By WILLIAM MONTAGU, M.D., M.B., F.R.C.P. First Edition. Pp. 362. London: Cassell and Co. (London) Ltd., 1930. 15s. 6d.

Dr WILLIAM MONTAGU writes on a highly useful, if somewhat obscure, but doubtless to be more and more useful, in psychiatry. It fills a gap which existed before the recognition of the frequency of psychogenic disorders in general practice and Dr Montagu's long and constant professional career has admirably equipped him to undertake this important task.

Despite the obvious enthusiasm for a method to ascertain that hypnosis is by no means a psychomotoric process and is thus not producing any disturbance of a technical, he demonstrates the history of hypnosis as adaptations and innovations. On criticism of subjective methods and the results which may be anticipated, pointing out that whilst it is relatively rare instances hypnosis suggestion alone has no more than a transient therapeutic effect. He demonstrates how efficient hypnosis can be when used as a method of local analgesia, psychotherapy, latent memory release, suggestion, and hypnosis, hysteria, hysterical psychosis and other methods of psychotherapy. One's attention is gripped by the Montagu's graphic accounts of several of his patients.

Comprehensively little space is devoted to the giving of instructions of actual hypnosis technique and methods of converting patients, although a large going into hypnosis alone, but probably these instructions are more because the skill that is being other practical suggestions can be obtained only by practice. The material presented provides an adequate foundation for any desire to learn hypnosis.

From the Sharp Thought of several years through the National Society of the Doctors and the Annual Migration of Montagu to the work of Freud and Ellerman who called Dr Montagu had to emerge from the staff of the University College Hospital as an account of his work. Hypnosis has been his subject. Now called for the A.J. of 1930 which publishes public demonstrations and by the formal recognition in 1931 of the British Medical Association, it has been in 1931. It is particularly this book was used in 1931 during the classes.

G. G. W.

Practical Medicine. By A. KESH MARR, M.D.(Lond). Pp. viii+262 with 118 figures. London: Lloyd-Louis Limited. Price 42s. 6d.

Dr Marr has produced for us a new book which guides us how to perform ourselves and our observations should be made for combined with a sense of realistic death. Without such guidance the inexperienced doctor first called to the scene could easily make mistakes. One must realize as of each error and how a saving is still based on an age when death by violence would seem to be impossible to the majority of us and find ourselves methodically without warning. The various signs of the subject are not set in just detail and often throughout by photographs which are very helpful in many ways preparing. One must try to be concentrated upon a work which is outstanding in every possible way.

J. L. R. C.

Notes Given for the Doctor. On Intoxication, Reciprocity, and other Graduate. Based on A. P. Jones, Handbook as used in the Chelmsley Group of the London Royal Infirmary. First Edition. First Published 1902. Pp. 32. London: H.K. & Sons. 24s. Price 2s.

This small important booklet which has just been published will prove to be most valuable for distribution to all of those patients given to show discharge from hospital following their initial admission on. It is literally nothing more than a printed pamphlet, but a question upon pages of advice and guidance for the doctor, self management, follow-up after care to be made from of appropriate alternative, food habits, and at times with low value value, suggest for 30 patients with and with, questions lists of various other values between 1000-1000 and 1000-1000.

It is essential, however, that all detailed patterns of payment as against savings intelligences should read a large light into the content of their claims such as Liverpool's contribution accounts to the Locomotive (Hawthorn) Society for the Home Guard as for his level as an only reference. For his little share is paid, at the same paper of general practice to such things as terms of the specific system, the various and performance of the country, details of some limiting the importance of relations as well as evidence in spending the contribution and great income money, which generally a whole page is devoted to the case of the last. Perhaps another couple of pages would have sufficed in this respect.

Nevertheless this little book will be found most useful in supplementing the patient's knowledge of his particular disease, with valuable information relating to diet, and recipes for the home preparation of suitable meals of varying caloric value.

L. G. T.

FOURTH EDITION, TREATISE ON PLASTIC SURGERY AND TISSUE TRANSFUSION, GRAFTING. By
JOHN A. McQUEEN, M.D., F.R.C.S.(Eng); F.R.C.P.S.(Edin); CONSULTANT PLASTIC
SURGEON, CLINICAL, ROYAL INFIRMARY (4th edition). Pp. 300 + 341 with illustrations.
Edinburgh and London: E. & S. Livingstone Ltd. Price 35s. net.

Unlike so many other medical publications this third book starts with the book ends in its history. The author has explained that a serious need, with this third publication on the treatment of accidents with particular reference to skin cover and repair of soft tissue damage.

The work is well written and exceptionally explicit and descriptive. It is divided into two parts. The first part of roughly 150 pages deals with the basic techniques of plastic surgery. The author has brought them, direct to form and procedure provides a text not only readable but can be digested with less than 40 lines knowledge of English. The second part of the work deals with the surgical applications of these basic principles and includes General Surgery, Orthopaedic Surgery, Head Surgery and Surgery of the Eye.

This book is unquestionably a most excellent work on the principles of plastic surgery and should prove beneficial to all surgeons who have to deal with trauma. It is certainly an admirable text as the author has adopted his descriptions as a maximum and as much more reasonably explicit, but it is felt that in its subsequent editions the book might well include more minute descriptions of particular conditions, techniques and procedures.

This book should be included in the library of every surgeon who is not already represented with the principles of Plastic Surgery and who may be faced with the treatment and treatment of traumatic lesions.

E. H. M.

MORRIS' TREATISE TISSUES 1960. Edited by Sir Cecil Winkley, B. A.F.C. C.B.
1125 PAGES 1960. PRICE FREE P.E.A. PAGE PRICE 75
£11.00 with 32 plates and color illustrations. London: Medical Press (Publishers)
7 Abchurch Lane. Price 10s. Postage 2s. 6d.

This well known textbook has now been published for twenty six years and will be familiar to most medical officers. Designed to keep the practitioner informed on the practical applications of the latest knowledge and to provide an useful reference source in the basic accepted methods of diagnosis and treatment, it includes authoritative articles by some of the foremost physicians and surgeons of the century. The descriptive methods selected have been thoroughly tested and are the results of hospital experience.

The author maintains the high standard of its predecessors and includes concise references to the latest, the treatment of various forms of injury, the practice on general medicine, and treatment of various forms of the skin, which throughout the comparison of diagnosis, the management of numerous body and the investigation and treatment of chronic disease.

J. W. W.

Notes of the Service

OBITUARY

Surgeon Captain H. G. (HARRY) DUDLEY (Rtd.) died on the 12nd December 1959 (born on the 26th July 1881) he qualified M.B. B.Ch. University of Dublin in 1906.

He entered the Royal Naval Medical Service as a Surgeon Lieutenant on the 16th May 1907. He was promoted Surgeon Lieutenant Commander 16th May 1915 and Surgeon Commander on 16th May 1940 and was placed on the Retired list (aged with the rank of Surgeon Captain on 19th July 1932).

Surgeon Captain DUDLEY was awarded the D.F.C. on the 2nd January 1919. He was recalled on the 1st September 1939 and returned to the Royal List on 10th October 1944.

Surgeon Captain A. C. PATTERSON R.N. (Rtd.) died on the 11th February 1960 (born on the 16th August 1881) he qualified M.B. B.Ch. Eng. L.R.C.P. London in 1905.

He attended Royal Naval Medical Service on 16th May 1911 as a Surgeon Lieutenant. He was promoted Surgeon Lieutenant Commander on the 16th May 1917 and Surgeon Commander on the 16th May 1923. He was placed on the Retired list (aged with rank of Surgeon Captain on 16th August 1932) and subsequently re-serve and was finally retired on 1st September 1945.

Surgeon Commander R. S. F. HANBROOK R.N. died on the 22nd January 1960 (born on the 9th May 1902) he qualified M.B. B.Ch. at Victoria University, Manchester 1917.

He entered the R.N.V.M. on 12th March 1918 as a Temporary Surgeon Lieutenant and transferred to the permanent list the 1st June 1919 at the rank of Surgeon Lieutenant, Commander. He was granted the rank of Acting Senior Surgeon Commander on the 12th March 1930 and promoted to Surgeon Commander on the 19th December 1939.

Surgeon Commander Hanbrook was aged 57 M.S. 10th August at the time of his death.

Miss E. M. D. SHIPLETON ADAMS A.B.C. (Succumbing Senior Q.A.R.M.P.S.) died in the Royal Naval Hospital, Haslemere on 16th February 1960. A Memorial Service was held in St. Luke's Church, Haslemere on 19th February.

R.N. women.

The news of the death of Miss Shipleton Adams was received with much regret at Britannia Royal Naval College, Dartmouth. She had been the Senior of the last batch of Sisters to arrive in the hospital before it closed down on September 1958.

Apprenticeships of her time have been suggested by Officers, Lieutenants, their wives and by the staff who served under her.

Before leaving the three Sisters were cited by the Wardeens and Miss Shipleton-Adams's speech on that occasion is still remembered by those who were there at the time.

Her signature on the entry of the Admiralty records is a memory of that evening and of her.

RETIRED AND DEPARTED

Compagnon d'Or du M. de l'Armée Médicale—Dutrie of the Rush
Surgeon Rear Admiral Sir C. J. FENNELL Q.C. Rtd.

HIGHER DEGREES

F.R.C.S. Eng.—Surgeon Captain F. G. B. LINDSAY. (He died on 1st March 1960)
M.Ch. Belgium—Surgeon Captain D. F. LINDSAY.

1914-1916.—Sergeant Commander H. B. Malton
1916.—Sergeant Commander T. C. Brown
1917.—Sergeant Lieutenant Commander H. J. A. Hain
1918.—Sergeant Lieutenant Commander (2) A. P. J. Bax

PROMOTIONS

To Sergeant Rear Assistant.—W. V. Burch (2) 1914
To Sergeant Lieutenant Commander.—D. J. C. Webster (2) 1914; W. V. Webster (2) 1915
J. M. Gorman (2) 1916; D. Widdington (2) 1916

ENTRIES FOR SHORT SERVICE COMMISSION

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M.B. Ch.B. C. W. Bryan Brown, B.M. B.Ch. R. K. Clarke, M.F. B.S. M.R.C.S.
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D. E. White, L.D.S.

RETIREMENTS

Surgeon Captain C. N. J. Jones
Sergeant Commander G. A. S. Anthony
Sergeant Commander (2) E. W. Long, Surgeon

WARDMASTERS, OFFICERS

PROMOTIONS

To Acting Wardmaster Sub-Lieutenant.—R. F. Fyfe, B.Sc.P.D. H. Harlow, B.Sc.P.D.
R. A. Jackson, B.Sc.P.D.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

PROMOTIONS

To Superintending Nurse.—Miss E. Clarke (1) 1914; Miss E. F. M. Elliott (2) 1915
Miss R. Hunt, A.R.N.C. (2) 1915
To Branch Nursing Sister.—Miss T. D. Doyle (2) 1914; Miss J. M. Laidlaw (2) 1915; Miss
A. D. Macdonald (2) 1916; Miss E. M. Northway (2) 1916

ENTRIES FOR SHORT SERVICE

Miss J. Mills, R.R. Nurse, F. M. Shaw, J. M. Thomson, J. C. Thompson, M. Wilson
F. A. Wynn

TRANSFERS TO SHORT SERVICE COMMISSION

Miss H. B. Clarke, Senior Nursing Sister, J. M. Clarke, Nursing Sister, A. D. Matthews,
Nursing Sister, D. M. Walker, Nursing Sister

RETIREMENTS

Miss D. A. Corring, Nursing Sister (2) 1915

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING AUXILIARY OFFICERS

Miss E. C. Buckley, A.R.N.C. Naval Nursing Auxiliary Officer (1) 1914
Miss E. L. Porter, A.R.N.C. Naval Nursing Auxiliary Officer (1) 1916

Dept. of Psychology
 University of Colorado
 Boulder, Colorado

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EDITED BY

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
ALVERSTOCK HAMPSHIRE



Reviews

THE R.S.M.A.'S SCIENTIFIC EXHIBITION, TORQUAY 1960 THE ROYAL NAVY'S CONTRIBUTION

BY

Surgeon-Captain G. MILLER, R.N.

In June 1960 the British Medical Association held its annual conference at Torquay and to mark the Royal Naval Medical Service was invited to contribute to the Scientific Exhibitions.

The Control of Tuberculosis in the Royal Navy" had been chosen as a subject for demonstration. Tuberculosis has always been regarded as an industrial disease of workers and has remained high on the list of resulting causes in the Royal Navy.

Records were presented covering a period of fifty years and the central theme of the demonstration was a pair of scales representing the balance between predisposing and controlling factors. The pointer of the scales showed the present prevailing rate: a little over 1 per 1,000 strength per year. In one pan were weights chosen to show the adverse effects of such factors as overcrowding, climatic stress, increased time below decks, the unsuitability of men with machinery for living space and drug resistance etc. In the other pan on the smaller side weights represented improved shipboard treatment, and selection better food improvements in habitability and B.C.G. vaccination. Indicating tapes from the weights led to photographs or short descriptive notes explaining their significance and a figure rather heavy weight lay on the beam to represent the increase in adverse factors which the outbreak of war could bring.

A number of attractively coloured histograms were used to represent changes in incidence over the years and the responses to mass tuberculinity and B.C.G. Two major advances in the control of tuberculosis, which in this country were pioneered by the Royal Navy,

In fifty years the prevailing rate was shown to have dropped from 2 per 1,000 per year to a little over 1 per 1,000 per year. In considering this fall, which at first looks disappointing it should be remembered that fifty years ago cases were well advanced before being diagnosed and left the worse to die or live as chronic invalids. Today cases are diagnosed and treated with material means, invariably with a promise of recovery and a useful life ahead.



The importance of these radiographic examinations is illustrated by a family incident in Singapore, (Singapore), where in the March of 1949 (and a rapid check-up incident that day) a young girl, 10 years old, who had been in the hospital from 11 months until 1 year old, died of tuberculosis. The girl had been in the hospital from 11 months until 1 year old, died of tuberculosis. The girl had been in the hospital from 11 months until 1 year old, died of tuberculosis.

In 1949 the first radiographic film was taken for the first time in the hospital. In 1949 the first radiographic film was taken for the first time in the hospital. In 1949 the first radiographic film was taken for the first time in the hospital.

Other interesting research showed the impact of the more recent national B.C.G. campaigns on the Malaysian incidence of tuberculous meningitis which was a small percentage of apparent fatal tuberculosis, and a sharp comparison of the incidence of tuberculous meningitis with subsequent tuberculous meningitis. This supported the generally accepted belief that a large reaction followed a greater risk of subsequent development of the disease.

More practical exhibits included a series of films showing a series of radiographic findings in a film pick-up reproduced on a large film and a series of colour transparencies showing the Navy's method of isolating the case of a Malaysian resident by means of a Perspex disc with a



scope of performance of appropriate tests. The method is considered superior to the more conventional one group technique.

Though the incidence of tuberculosis in the Navy has over the years been greatly reduced the figures published by the Registrar-General and other investigations show it still to be higher than comparable groups in civilian life and the other services. There is no room therefore for complacency and with the future role of the Navy likely to envisage greater confinement of men before ships and more time completely submerged, the control of tuberculosis must remain an important responsibility of the Naval Medical Service.

The local authorities arranged many visitors during the week including several consultants in chest diseases and specialists in tuberculosis whose comments and advice were welcomed. A large photograph of Sir M. S. Turpin was greatly appreciated by the local residents but the highlight of the week was the visit of Sir R. H. the Duke of Edinburgh, who showed considerable interest in the Navy's position. The President of the R.N.A. Sir Arthur Power, also paid a formal visit.

As is usual with the British Medical Association's annual meeting, in addition to a valuable series of lectures and discussions on various current medical problems there was a formidable social programme. This gave a welcome opportunity for Service Medical Officers to meet their opposite numbers in civilian life.

An innovation this year was a lunch party arranged by Doctor Sir George B. Dalziel (past and present officers of the Royal Naval Medical Service (R.N.R., R.N.V.R., and Commonwealth Navies)).

The chair was taken by Dr. Dalziel (past) and a short address was given by Mr. Lawrence Abel, serving Officers from Devonport, Plymouth and the Medical School attended as well as a number of ex-naval doctors. Although there were only 30 present the address was most valuable and it is hoped that such a lunch will become a regular feature of the Annual B.M.A. Meeting.

The Navy's demonstration was organized by the Royal Naval Medical School, but it could not have achieved its undoubted success without the help of the medical officers in charge of the Mass Radiography Units and also Surgeons Captain J. Lees, Surgeon Captain N.E. Hephburn and Surgeon Commander K. J. O'Connor.

REPORT OF A PILOT TRIAL OF A NEW DRUG (SRF 5154) IN THE TREATMENT OF CHRONIC SCHIZOPHRENIA

BY

Surgeon Commander Wm. CULLEN, R.N.

AND

A. LEITCH

Consultant Psychiatrist, Barrack Hospital, Devon

SRF 5154 is a phenothiazine derivative with the chemical formula 10-(4'-dimethylpiperino-2-methoxy-propyl) 10-fluoro-methyl phenothiazine (HCl) and structure as below:



It is a white crystalline powder with a melting range of 176 to 177° C. and 185 to 186° C. and is very soluble in water.

Laboratory research has shown it to be as comparable with chlorpromazine—

(1) Five times as effective in blocking the conditioned response response in rats.

(2) Three as effective in suppressing motor activity.

(3) Ten times as effective in its anti-emetic activity.

(4) Three times as effective in its anti-tetanus activity.

These laboratory results suggested that in the clinical field the scope of use for SRF 5154 is the same as that of chlorpromazine; that it could be used in smaller doses and that it should produce fewer side effects.

Pharmacology of the Drug.

As knowledge of this drug seemed to be quite limited—Smith, Kline and French, the manufacturers concerned have reported a series of 24 cases in their literature on the drug, and Grayson, Cohen and Molloy (1958) have reported on a further 14 cases, it was decided at the beginning of the clinical trial to use initially two groups consisting each of 6 long-stay patients suffering from schizophrenic illnesses, and to control these groups by constant clinical observation and extensive laboratory investigation.

It was intended following this initial phase of the trial to widen the scope of treatment and to treat a substantial number of patients of the varied experience of the drug recruited this

The results obtained in these 12 patients, however, were not encouraging, and as it was learned in the course of the trial that the drug would not become generally available for the treatment of patients, the second phase of the trial was not undertaken.

It was felt however that it might be of value to record the findings of this limited trial and the present report has therefore been prepared.

SELECTION OF PATIENTS

All the 12 patients in the present study are males whose ages range from 48 to 70 years and whose average age is 54 years. They are all long-stay patients suffering from schizophrenic illnesses who have been in hospital care for many years (both in this hospital and elsewhere) who have been intensively treated in the past by various antipsychotic (neuroleptic) drugs, treatment drug therapy including other pharmacotherapy and who have failed to show any rational response to these various treatments.

COURSE OF THE TRIAL

The trial was begun in the summer of 1959 and continued until January 1960.

The initial dosage of the drug was 5 mg. per day given in 5 equal doses spread throughout the day. The dosage was slowly increased to a constant amount to a total of 60 mg. per day and then subsequently adjusted as the clinical response of the patient seemed to indicate. The maximum dosage used was 80 mg. per day.

At the conclusion of the trial the dosage was reduced to a quarter amount thus the initial build up of the drug during the beginning of the trial.

It was eventually discontinued at the end of January in all except 3 patients who seemed to have benefited from it to a limited extent.

2 of these patients now remain on treatment with this drug.

LABORATORY STUDIES

The laboratory investigations consisted of the following:

- | | |
|--|--|
| (1) Liver Function Tests | (a) Estimation of Serum Proteins (Total and Globulin) |
| | (b) Estimation of Bilirubin |
| | (c) Estimation of Thyroid Function |
| | (d) Estimation of Alkaline Phosphatase |
| (2) Haematological Examination | (a) Estimation of P.C.V. |
| | (b) Estimation of Hb |
| | (c) Estimation of white cells—both total number and differential count |
| (3) Routine examination of urine for protein and bile pigments and salts, and microscope examination if this was felt to be indicated. | |

Before the trial was commenced each patient was subjected to the laboratory examinations noted above. These tests were repeated at fortnightly intervals throughout the period.

CONCLUSIONS

(1) *Endocrine Findings*

Adrenocortical examination showed no change, particularly the fact that no protein or ketone was ever detected in any of urine specimens.

(2) *Histoneological examination* was equally negative. Thus, i.e., no suggestion in any case of change in the blood picture and both the total white cell count and the differential white cell count remained unchanged throughout the trial. The E.S.R. also remained unchanged.

(3) *Liver function tests* also failed to show any material change in any of the subjects during the course of the trial and all the findings remained throughout within normal limits.

(2) *Chemical Observations*

(a) *Side effects*.—No side effects of any significance were noted in the course of the trial. Two patients became slightly restless and one complained of difficulty in focusing on any object; these complaints were transitory, however, and no specific treatment was offered to control these symptoms.

(b) *Psychomotor state*.—None out of twelve cases showed an response whatsoever to the drug and in the remaining five no exact improvement was of a limited character consisting simply of somewhat more spontaneous behaviour with greater interest in their surroundings and companions.

No specific effect on hallucinations, delusions or ideas of reference was noted.

SUMMARY

This is a brief account of a pilot trial with a new phenothiazine on a limited number of chronic patients, undertaken in the first place with a view to determining the toxicity of the drug in relation to side effects and laboratory findings and which it was planned to extend at a major centre to determine its value in psychiatric treatment.

This second phase of the trial was not essentially uninformative as, though the drug so far was found to be safe and easy to handle, the lack of any marked response from a psychiatric point of view on this limited number of patients was not encouraging. In addition it was feared that it had been divided by the manufacturers not to counter the production of this drug.

ACKNOWLEDGMENTS

We wish to thank Messrs. Smith, Kline and French Laboratories Ltd. for sample supplies of the drug; also Dr. G. E. McGowan of the Department of Pathology, Bristol Royal Infirmary and Mr. C. J. Barnes, Senior Laboratory Technician of Barrow Hospital for the laboratory work involved; and Miss J. Davies, Pharmacist of Barrow Hospital.

REFERENCES

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Smith, Kline and French Laboratories Ltd.—SRP 1144 A (unpublished results).

AN IMPROVED CONNECTION FOR No. 12 MAGILL ENDOTRACHEAL TUBES

BY

Surgeon Lieutenant Commander J. C. H. B. N.
and Sixth Fleet Duty Officer (On V. DEBOLMAN)

Two vertical limbs of the standard Magill Section T Piece Connection, size five, has an internal diameter of seven-sixteenths of an inch, so has a standard twelve Magill endotracheal tube. The side limb of the connection has a smaller diameter, three-eighths of an inch, and consequently some of the advantages of



FIG. 1



Fig. 1

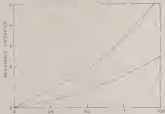


Fig. 2

large bore cylindrical tube are lost in the connector. In addition the standard rubber mount has a maximum diameter of three eighths of an inch causing a further increase in resistance to gas flow.

To overcome these disadvantages we have modified the section Y piece in order to increase the bore of the side limbs and to eliminate the rubber mount. The modification is shown in figs. 1 and 2. The side limbs of the section cannot be removed and the diameter of the remaining section is increased to at least seven sixteenths of an inch. The metal connector of a rubber mount for valves made on female fitting is also removed and is substituted with a male connector and the two soldered together.

Fig. 3 shows the resistance at various flow rates of above, the standard connector with rubber mount and below the modification.

ACKNOWLEDGMENTS

We wish to thank Mr. Warner, the hospital engineer who carried out the modifications and Leading Sick Book Attendant (R) L. Davies for the photographs.

We are indebted to Surgeon Vice Admiral W. R. S. Penderidge C.B.E. for permission to publish this paper.

General Notes and Cases

**TREATMENT OF GONORRHEA ON THE FAR EAST
STATION**

BY

Surgeon Lieutenant W. C. SCHMIDT, R. N.

During the past two years a number of observers have commented on the appearance of penicillin-resistant strains of gonococcus.

King [1] in an article in the *Lancet* entitled "The *N. Dring* Disease (Venereology in London)" discussed a series of 42 cases of gonorrhea treated with penicillin which demonstrated an increasing number of clinical failures as the in vivo minimal inhibiting concentrations of penicillin narrowed. He concluded that "There is evidence that penicillin *resistant* strains of gonococci are now emerging. Some cases of acute gonorrhea fail to make any response to doses of penicillin which in the past were nearly always efficacious. Repeated doses of penicillin and doubling the dose only have no effect. In other cases response seems satisfactory but relapse follows within a day or two. Quantitative assays test for sensitivity to penicillin suggest that in these cases responses from the organisms are considerably less sensitive to penicillin than the Oxford saprophytic or other strains of gonococci."

Craddock Watson *et al.* [2] made a study of 200 cases of acute gonorrhea, were between October 1957 and February 1958 in the V D Department of the London Teaching Hospital. Cultures of the organisms were made in each case and the sensitivity to penicillin, streptomycin and cephaloridine determined quantitatively. One of the surprising features of these results was the fact that 169 strains out of 200 were inhibited by 5 mg/ml. sulphathiazole, this is in sharp contrast to the findings of Danlop, Lave and Finland who reported that the majority of 85 strains of gonococci isolated by them in 1949 required more than 40 mg. sulphathiazole per ml. Craddock Watson and his co-workers treated these 200 cases with 100,000 units penicillin penicillin which failed in 25 (12.5 per cent.) of them and also showed that the number of clinical failures increased as *in-vitro* penicillin-resistance increased. They concluded that "Our findings presumably reflect the abandonment of sulphathiazole for the treatment of gonorrhea in this country in recent years" and made the following

resistance to penicillin. The overall cure rate using 300 000 units of penicillin is not satisfactory (87.5 per cent.) but in view of the experience described in this paper a dosage of 600 000 units will be used in future and clinical response will be compared with streptomycin and sulphadiazine.

One of the latest reports comes from Epstein [5] who treated 145 cases of acute gonorrhoea in Korean Troops in Korea between 1st January, 1955 and 1st April, 1955. His initial treatment was five daily injections of 600 000 units penicillin and 4 days, then vast increase in the dose of penicillin was played compared with current practice in the U.K. he experienced no fewer than 50 treatment failures. Warriors of these failure cases were given a second course of penicillin and a successful outcome achieved in most of them. Epstein considers that his 50 per cent. failure rate was due to acquired penicillin-resistance although he did not have the laboratory facilities to demonstrate this.

The evidence from the United Kingdom indicates that strains of gonococcus which show resistance are only partially resistant and that clinical cures may still be obtained by increasing the dose of penicillin and blood levels are attained which are effective against the particular strain of organism. Kang in the *British Medical Journal* [4] advises treating new cases of acute gonorrhoea with 600 000 units of procaine penicillin or 1.9 grams streptomycin and to use the other drug without delay should the one chosen fail to produce the desired effect.

In 1959, a frigate together with eight coastal minesweepers, sailed from Malta to join the Far East Fleet. Altogether, the Indian Fleet (Far East) comprised some 452 officers and men. It was anticipated that the incidence of venereal disease in the fleet would rise considerably in the Far East and during the first four months on the station it proved to be the greatest single medical problem. Between 1st December, 1959 and 31st March, 1960 no fewer than 189 fresh cases of venereal disease were treated in the sick bay.

(a) Gonorrhoea	—	68 cases
(b) Non-specific urethritis	—	41 cases
(c) Chancroid	—	4 cases

These figures compare most unfavourably with a total of 47 cases treated in two years on the Mediterranean Station with seven coastal minesweepers in the fleet (a further 250 cases) instead of only eight.

Early experience confirmed that the incidence of venereal disease was rising sharply and it was decided to carry out a small controlled trial to obtain some indication of the incidence of antibiotic resistance in gonococci on the Far East Station. The fleet was based at Singapore and the minesweepers were stationed to the coast of Malaya during the period under discussion although Hong Kong was visited on one occasion during the month of March. It was learned unofficially before the trial that the incidence of penicillin resistant gonococci in Hong Kong was high and cases of penicillin resistance there will be considered separately.

MATERIAL AND METHODS

Eighty-three of 141 cases out of a total number of 64 cases of acute gonorrhoea treated in this way between 1st December 1959 and 30th March 1960 were available for scrutiny, the remainder having been forwarded to other clinics and establishments where the patients left the hospital. 15 of these cases were conducted in Singapore or Malaya, eight in Hong Kong.

Diagnosis.—Laboratory facilities on a small sea-going ship are limited and both the diagnosis and follow-up of individual cases were based entirely on the microscopic examination of slides stained by Gram's method, together with the clinical findings. Throughout the trial rigid microscopic criteria were applied and organisms considered to resemble the gonococcus had to be Gram-negative kidney-shaped diplococci with a flat proportion of transitional groups of organisms present on the slide. In cases of doubt the slide was repeated twenty-four hours later.

Management.—Once the diagnosis had been confirmed a 5.0 ml. sample of blood was taken for post-treatment P.P.R. and Kahn tests and a single intra-muscular injection of either penicillin or a representative given. The patient was examined the following day and a further slide taken. Cases responding to the single injection normally had no gonococci on the slide taken after twenty-four hours and the discharge ceased altogether within forty-eight hours. If gonococci were seen after twenty-four hours the slide was repeated on the following day when the antibiotic penicillin of these organisms was taken to indicate clinical failure of the particular treatment given and the signal for a change to streptomycin or penicillin, as advocated by King [1]. A number of cases of persistent and/or discharge were encountered in which gonococci had disappeared from slides made twenty-four hours after the first injection and these were regarded as cases of spontaneous non-specific cure and treated with either a course of sulphamamide or one of the penicillins group of antibiotics.

TREATMENT AND RESULTS

Singapore and Malaya

Individual cases were placed at random in one of three treatment groups:

- (1) Group A received a single injection of 300,000 units of P. A. M. (Penicillin G) penicillin in oil with 2 per cent. aluminium monostearate).
- (2) Group B received a single injection of 600,000 units of P. A. M.
- (3) Group C received a single injection of 1.0 gramme streptomycin.

Results

The results of treatment are set out in Table I below.

TABLE I			
Group	No. of cases	No. of cases failures	Failure rate
A	11	2	18.2 per cent
B	8	1	12.5 per cent
C	14	2	14.3 per cent

MATERIAL

In view of the modified reports of large numbers of penicillin-resistant strains of gonorrhoea in Hong Kong, it was decided to double the dose of penicillin in Groups A and B, so that cases in Group A received 400 000 units of P.A.M. and 400 000 units in Group B 1 200 000 units. Cases in Group C received 1 0 gramme streptomycin as before. The results are shown in Table II.

Table II

Group	No. of cases	No. of clinical failures	Failure rate
A	3	2	66.7 per cent
B	3	2	66.7 per cent
C	3	1	33 per cent

DISCUSSION

The small number of cases treated, particularly in the Hong Kong series, makes any detailed appraisal of these results impossible, but nevertheless, the following points seem worthy of comment.

(1) In the Singapore-Malaya series, the mean failure rate in the 23 cases of Groups A and B was 57.8 per cent. No apparent benefit resulted from increasing the dose of penicillin to 400 000 units, but the small number of cases invalidates conclusions for this.

(2) From allowing for the small number of cases treated in Hong Kong, the 67 per cent mean failure rate obtained with single injections of penicillin is appreciably higher than that experienced in the Singapore series.

(3) The failure rate using single injections of 3 0 gramme streptomycin was 33 per cent in cases treated from Singapore and Malaya.

Lipson's failure rate of 30 per cent, using penicillin in Kuala Lumpur, was the highest recorded to date and was higher than the 12.3 per cent failure rate (4) obtained by Craddock-Watson *et al.* in London. The results obtained in the small series, using conventional doses of penicillin, suggest that the development of penicillin resistance in the gonococcus is gathering momentum in certain parts of the world and it is perhaps not surprising that notorious black-spots such as Hong Kong have taken the lead. Increasing the single dose of penicillin to 1 200 000 units did not produce any dramatic improvement in results, despite the claim made in the Public Health Service of the 'Annual Report for Hong Kong 1959' which states that penicillin continues to be the first choice for the treatment of syphilis and gonorrhoea in the Colony and makes no mention of penicillin resistance in the gonococcus.

Lipson's figures using 3 0 Mega units of penicillin indicate the pressing need for urgent laboratory investigation in the Far East of the development of antibiotic resistance in the gonococcus to be controlled. Such an investigation could be profitably coupled to a clinical trial along the lines followed by Craddock-Watson *et al.*

The risk of making a non-specific syphilitic infection with penicillin administered in the treatment of gonorrhoea has until recently been the most

important factor keeping the dose of that drug as low as possible. In 1940 when penicillin was used to treat the large numbers of cases of gonorrhoea immediately after the war, the incidence of syphilis was also in a peak and the risk was indeed a real one. During the past fourteen years, however, the incidence of syphilis has fallen throughout the world and the risk of making the disease but correspondingly lessened. Last year, for example, there were only 38 cases of primary and secondary syphilis treated in Government Clinics in the Colony of Hong Kong. Some workers consider that provided that adequate Wassermann surveillance is rigorously carried out, the risk attending the administration of 5.0 Mega units of penicillin in the treatment of acute gonorrhoea is now acceptable. This argument would be more acceptable, however, if there were no alternative treatment available but Craddock Watson's results in 1950 lend strong support to his recommendation of streptomycin plus a sulphadiazole should 400,000 units of procaine penicillin fail to control the infection. In the absence of further information on the development of antibiotic-resistance in the gonococcus in the Far East, this method would seem to be preferable to increasing the dose of penicillin as suggested by Brown with the knowledge that the treatment will fail in 20 per cent. of the cases.

CONCLUSIONS

The results of treating 40 cases of gonorrhoea in Singapore, Malaya and Hong Kong in early 1960 suggest that the development of penicillin-resistance in the gonococcus is gathering momentum in the Far East, and underline the urgent need for laboratory investigation. While treating the results of such an investigation, it is recommended that cases of acute gonorrhoea are given 400,000 units procaine penicillin initially and if this fails to control the infection, then the treatment is changed to 1.0 gramme streptomycin plus a course of one of the sulphadiazoles as suggested by Craddock Watson *et al.* It is considered that this method of tackling the problem is preferable to increasing the dose of penicillin, which increases the risk of making syphilis real and does not appear to effect the desired result very much, unless large doses are employed.

SUMMARY

The results of treating 40 cases of acute gonorrhoea contracted in Singapore, Malaya and Hong Kong are described. In Singapore and Malaya, the failure rate using single injections of either 300,000 units or 400,000 units of procaine penicillin was 25.0 per cent and 50.0 per cent using 1.0 gramme streptomycin. No apparent advantage was obtained by increasing the dose of penicillin from 300,000 units to 400,000 units in this series. In Hong Kong, the failure rate in 4 cases treated with single injections of penicillin was 50.0 per cent. Despite this, that the dosage was increased to 800,000 units and 1,200,000 units in the two trial groups.

It is considered that there is an urgent need for laboratory investigation of the problem of antibiotic-resistance in the gonococcus in the Far East, because

Increasing the dose of penicillin used in the treatment of acute gonorrhea, as advocated by Epsom, is not without danger and in the absence of reliable data on the state of antibiotic-resistance in the gonorrhea it is recommended that 1.0 gramme streptomycin combined with a course of sulphonamide be given should 600,000 units of penicillin penicillin fail to bring the infection under control.

ACKNOWLEDGMENT

I should like to express my thanks to S.B.P.D.R. Lushy for his assistance in preparing the slides and the preparation of the V.D. Chart, which occupied so much of the time during the early days on the Far East Station.

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A CASE OF ESSENTIAL HYPERCHOLESTEROLAEMIC XANTHOMATOSIS ASSOCIATED WITH LIP-EMIC SERUM

by

Stephen Lanchant R. RALFORD, B.N.

THE particular interest in this case lies in the occurrence of a milky (lipemic) serum at essential hypercholesterolaemic xanthoma (not a disease which, until recently, was regarded as being invariably associated with a clear (non lipemic) serum).

CASE REPORT

The patient was a male about aged 25 years. His complaint was of lumps on his elbows, knees, wrists and heels (not on scapulae) and on average increased size of his palms. He had noticed these changes developing in the preceding eight months but not regarding them as anything serious. He had not sought advice earlier.

On examination the large (200) slowly regressing (or receding) lumps were few orange yellow xanthomatous nodules varying from 1 to 10 mm in diameter. Over the knees and elbows they were (not) by large and were confluent; a lump on the foot (not) they were small and scattered. There on the wrist were confined to the joint and were (not) exposed. The skin over the lumps was thin and marked with blood vessels. Surrounding them was a thin erythematous halo. Some were slightly tender on pressure.

The palms were a pinkish orange colour and no clear demarcation the palmar lines was marked with fine orange nodules. There were no lesions in the eyelids or tendons; no maculae or corneal arcs.

General physical examination revealed no other abnormality. In particular there was no enlargement of the liver or spleen, no jaundice and no abnormality of the C.V.S. or heart. There was no glycosuria or proteinuria.

Neuroticism, together with a raised serum cholesterol occurs in a number of conditions. These are tabulated as follows:

(1) SYMPTOMATIC—

Secondary to hypoparathyroid diabetes mellitus, glycogen storage disease, urinary carcinoma, chronic pancreatitis.

(2) ESSENTIAL—

(a) Essential hyperparathyroidism

(b) Pseudot (Pseudal) (Pseudopar) hypercholesterolaemia xanthomas

The typical features of essential hyperparathyroidism xanthomas are large xanthomas (varying crops of small tender yellow-headed papules surrounded by an erythematous flare) in milky serum and in some cases, hypotension, angina and attacks of abdominal pain.

The typical features of essential hypercholesterolaemia xanthomas are plane and tuberos xanthomas and a clear serum.

In addition further means of differentiation based on serum lipid analyses, responses to heparin, the tolerance and tumour analyses have been described (Smith, 1976; Borer, 1977).

Changshai (1964) and Borer (1957) pointed out that in their experience and in some other reported series there existed cases with features of both conditions. Since they were able to classify as essential (idiopathic) hypercholesterolaemia xanthomas with an associated hyperparathyroidism in one of the cases the hyperparathyroidism developed while under observation others had a number of features of both conditions and these they classified as mixed types.

The case here described is very similar to the three cases Borer described of essential (idiopathic) hypercholesterolaemia xanthomas with associated hyperparathyroidism. It is interesting how the picture changes have been comparable in each case.

I have no explanation for the low blood sugar. The investigation was repeated and a similar result obtained. He had no symptoms of hypoglycaemia at any time.

It will be noticed that the lesions in this case followed the usual distribution of tuberos xanthomas in being most marked at the sites of pressure and trauma—the elbow having a dark job perhaps explaining these as the main aspect of the work as well as those on the buttocks. A practical point arising in this connection is that some tender deposits formed in the baggy seat and the being on the elbow it caused the patient considerable inconvenience. Another one would have been prefrontal.

The genetic features of essential hypercholesterolaemia xanthomas have been studied by Williams *et al.* (1968) and Hazzanides *et al.* (1977). The mixed blood cholesterol is a dominant trait and the fully developed syndrome with xanthomas is possibly the homozygous state. In this case it has not been possible to study the family thoroughly, but it is interesting to note that the father had early coronary disease and that the mother had gone hyperlipoproteinaemia and hypercholesterolaemia have both reported in families with gout (Albersen,

1915, quoted by Herrick-Jones, 1917). Hyperparathyroidism has similar characteristics in some cases but the picture here has to my knowledge been worked out.

The prognosis of both hypercholesterolemia and hyperparathyroidism is bad, early death from coronary occlusion occurring in both (Lever *et al.* 1934).

Treatment of the disease is based on the assumption that reduction in the serum cholesterol will reduce the tendency to atherosclerosis. This has been attempted by both diet and drugs. Reducing the intake of cholesterol or inhibiting its absorption from the gut, by adding Sclerolol (a sterol-ester of cholesterol) to the diet is not successful, as the body can readily manufacture cholesterol from other sources. By way of drug therapy, thyroid extract and, untreated and treated, have all been used without notable success.

Milman and Wigand (1935) treated 8 cases of secondary hyperparathyroidism with a diet rich in cereals and obtained a considerable fall in the serum cholesterol level. This correlated with Gross-Sewman *et al.*'s report (1936) on the effect of certain mineralized oils on cholesterol metabolism.

In the present case a substantial rapid fall in the serum cholesterol level has been obtained by the reduction of a highly atherogenic fat to the diet and it is hoped the ultimately inevitable treatment will be means of controlling a serious disease.

ACKNOWLEDGEMENTS

I am grateful to Surgeon-Commander G. M. Stoll, R.N., for permission to publish this account, and to Surgeon-Commander F. D. Steele, R.N., for valuable advice.

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Reviews

Blindness Deception. By Charles Swenson. (ed. by J. R. C. Lee). *Physician Royal Deceit* is a House Hospital Consulting Physician (St James' Hospital, Westminster Hospital, West End) (England) Eye Infirmary and the University of Liverpool. Fifth edition. Pp. xix + 478. Edinburgh and London: W. B. E. Livingstone Ltd. Price 25s. Home postage 1s. 1d.

This popular medical text-book is, unfortunately, its title claims in the cover of elegant cover. It lacks a really an indication of its popularity and of the determination of its editor to keep abreast with medical eyes and the ever widening horizons of knowledge.

To those who know this compact book of medical diagnosis, it may be said that the latest edition has been thoroughly revised with substantial alterations and 148 pages of entirely new matter clearly supported by several of Swenson's former editions, especially in the new subjects.

To the uninitiated it is useful to say that the book contains 26 chapters, all of which contain three to four pages of text. The first three chapters deal with the general principles of diagnosis, the next three with the general principles of the various of the special symptoms followed by a few paragraphs containing the most important and relevant data belonging to each individual named disease process, such as rheumatism, heart disease, pneumonia and meningitis, etc. At the end of the book are three chapters giving general values, the use of radiations, and a chapter on the diagnosis of the various groups of drugs.

Incidentally the book can be considered as a small volume of the *British Medical Journal* of the *Endocrine Deception* of *Brain Symptoms* and so higher price need to be given to the subject.

It would appear that the medical student and newly qualified doctor would be the main ones to obtain the book, with little from the diagnosis, radiology, and for the information content what better way than to have a series of chapters on the general groups "How would you distinguish a brain presenting with a specific symptom" and then the differential diagnosis? (On the other hand, many a busy practitioner may find the book of somewhat value when attempting to select an individual from the cause of the diagnosis problems presented in the various books.)

[G. T.]

Brain Deception in the Deception. By G. H. Clarke M.D. (ed. by J. R. C. Lee). Pp. xix + 478 illustrations. London: W. B. E. Livingstone Ltd. Price 25s. 1d.

There seems to have been a recent year of new neurological textbooks, most of which have about half more than repeat with little variation the subject matter of earlier editions, and with a few additional paragraphs on modern developments.

In the preface, in the book under review, the author has pointed out that since the first edition of the *Brain Deception* in the *Deception* (1952) is considerable there is no other work devoted exclusively to the subject of the brain. This is still most made such a volume of recent interest.

Dr. Clarke has divided the book into a number of short sections, in fact of short sections, and has been repeated in the book are grouped according to their content, e.g. three

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He returned from Royal Naval School Norway on a Norwegian motor boat August 1902. He was promoted to 1st Lieutenant on the 2nd August 1902, and Norwegian Commander on the 2nd August 1904. He was placed on the retired list with the rank of Norwegian Captain on 26 August 1905.

The symposium was held at the University of London on 14-15 March 1994.

Choosing World War I for historical role play, the 10th M & S Circle was voted the Current Round.

Barryton, Carolyn B. M. LANGMUIR, B. A., died on the 1st May 1990. He was born on 17th July 1929, and married M. B. C. B. Esq. A. B. C. Esq. on 1st May 1955.

Sergeant Captain Lincolnton served the Royal Naval Medical Service as a Surgeon on the HMS Viper 1937. He was promoted Surgeon Lieutenant Commander on the HMS Viper 1944 and Surgeon Commander on 14th November 1946. He was placed on the Retired List with the rank of Surgeon Captain on 15th July 1959. He was appointed R.N.D. on 1st January 1960, January 1962 and held that appointment until January 1964. On 25th July 1968, he was promoted and was transferred to the R.N.D. on 1st January 1969. He died 19th

During World War I he served in the Royal Street Hospital, Harlow, and in M M S College and H M S Ceylon. In World War II he was captured in M T D Nevada and was held in captivity at M M S, Mexico and at H S, Texas, Canada.

Sergeant Captain C. W. H. ROBERT, Royal Navy, died on the 11th of May 1900. He was born on the 1st January 1860, and qualified as D. R. C. on the 12th January of the 19th March 1884, and was promoted to the rank of Captain on the 12th of May 1900.

Sergeant Captain Joyce joined the Royal Naval Medical Service for a Short Service Commission on the 2nd December 1900. He transferred to the Portuguese Line on the 17th March 1902. He was promoted to Surgeon Lieutenant-Commander on the 2nd December 1906. Surgeon-Commander on the 2nd December 1942 and to Surgeon Captain on 10th June 1944. Surgeon Captain Joyce was placed on the Retired List (indefinitely) with pay 25th April 1945.

0 1 2 3 4 5 6 7 8 9

By the, automatic death of Christopher Reeve I have lost an old and valued friend, the Screen has lost a very good looking Young Man. I am surprised to write that out of my mind, considering Spider Officer just for the pleasure of watching how Christopher would have processed an such a phrase had he were at my post. But, a person, who my knowledge and obviously great intelligence in the doing of the correct word to report his message I can't consider him someone, in my, had slightly misled to some what reading party, his language in doing his job, at the offending moment. You know, you too have only one experience in such a job. The person you, as my wife have been the most extraordinary Spider Officer, has been, surely could not live, hope out of, the most astounding. Christopher of his most engaging, with a winning smile, in disambiguating any suggestion of confused evidence.

[illegible]

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1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

I would like to add that I have so thoroughly loved the service and experience during the last drive on this plane, that I have changed my attitude towards it completely. As a result, I had developed a negative idea, which severely damaged the mood of the crew. It is described as in P12. Shortly before the last 1st level drive started, somebody around me said on page open a new crew is needed and a considerable amount of maintenance.

¹⁰⁰ He wrote, as well as anyone, that what the food economy was likely to be, and during the last century through which he lived, and through which we are steadily changing, it was absolutely clear to all that his days were largely ignored. The food he ate was equally ignored. How he had a profound and personal philosophy about food was not clear at the time.

The manuscript is nearly as long as his work, and perhaps he is so far removed he had people transcribe it for him. It is a little shorter, somewhat of a reduction, but the words will not differ from it.

¹¹ The focus on matter in any of these books (let us say *opere minori*) is not as pronounced as it is in *opere maggiori* of the decade and still declines as it comes along, and therefore death is less of a theme eventually.

Some weeks before he died I remarked to him that I had learned that the great many-voiced kind of music—such as world music or fusion jazz—was nearly a disaster, and I could not wait for his thoughts. He explained quite simply that the idea was to lead it to a point where it would no longer be heard fully, merely accepted as a very faint and distant sound.

The first work was that by *et al.*, should be published on the website of European subjects to know yourself and know your friends.

¹ Joseph P. Coyne is Nathaniel W. L. Abbott, Jr. died on May 17th, July 1948. Born on July 22, 1879. Married to Mrs. C. W. Coyne. 2 Mrs. C. W. Coyne on 1902.

Regiment Captain William served the Royal Naval Highland Service as a Sergeant on the 2nd November 1906. He was promoted Sergeant Lieutenant Commander on the 31st November 1912 and Sergeant Commander on 1st October 1917. He was placed on the Retired List with the rank of Lieutenant Colonel on 1st July 1920. 1,000

During World War I he served as Hqs. S. Lt. Col. Hqs. S. Eng. Cavalry. H. M. S. Platoon H. M. S. Company and in the Lister Hospital. During World War II Surgeon, Captain. Served in a combat position.

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U.S. DEPARTMENT OF AGRICULTURE

PROMOTIONS

To *Surgeon Royal Admiral* 1024—W. *Holgate*, D.S.O., Q.M.D.S.

TRANSFERS TO THE PERMANENT SERVICE

Surgeon Lieutenant C. H. *Stewart* and J. M. *MacIntyre*, *Surgeon Lieutenant* 10118 W. J. *Gregory* and P. C. *Wright*.

ENTRIES FOR SHORT SERVICE COMMISSIONS

P. A. *Johnson* M.D. B.S. L.M.S. *Wales*, M.D. B.Ch. J. P. *Lindsay* M.B. B.S. M.R.C.S. L.R.C.P. D.S. *Mind* M.B. B.S. A. J. *Bevel* M.D. Ch.B. J. A. *Robt* M.D. D.I. *Chesham*, L.D.S. J. E. *Smith* M.D. L.D.S. G. B. *Kettle* B.S.S. L.D.S. P. *Robinson*, L.D.S.

RETIREMENTS

Surgeon Vice Admiral Sir Cyril *May*
Surgeon Commander W. W. *Stewart*
Surgeon Commander Dr W. P. *Wilson*.

WARDMASTER OFFICERS

PROMOTIONS

Principal Wardmaster Lieutenant—L. K. *Boyd*, and K. R. *Arvey*.

RETIREMENTS

Wardmaster Sub Lieutenant M. C. *Wynn*.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

PROMOTIONS

To *Senior Nursing Sister*—Miss G. F. *Andrews* (1844-86), Miss D. M. *Cresson* (2044-86), Miss R. J. *Hughes* (244-86).

TRANSFERRED TO SHORT SERVICE

Nursing Sister Miss M. S. E. *Southcott* (2844-86).

ENTRIES FOR SHORT SERVICE

Master C. M. *Green*, D. A. *Proctor*, J. *Taylor*, M. E. *Tucker*.

RETIREMENTS

Miss A. M. I. D. *Hardy*, A.B.C. *Superintending Sister* (1954).

ROYAL NAVAL MEDICAL CLUB

It is reported that the Royal Naval College, Greenwich, is not available for the Annual Dinner 1964 on any Friday. After considering many possible alternatives, the Club Committee decided that the facilities and financial advantages of Greenwich were such that Members would prefer to hold the Dinner at Greenwich on a different day rather than go elsewhere on a Friday. The date of the Dinner has therefore been fixed for Monday, 14 May.

ADMIRAL'S FLUET ORDERS—1940

(This page is prepared for later proposals)

2945—Isotelling—After care of Personnel Injured

3044—Medical Regulations for Personnel who volunteer for Service in Nuclear Powered Submarines

3135—Medical—Dysentery—General Hygiene Program

3216—Medical—Rules for Individual Carrying Condition Suit to Hospital

3344—Medical—Radiotherapy—Precautions for Use

3397—Radiation Hazards—Precautions for Personnel concerned with use of X-ray apparatus in Radio Active Material

3515—Medical—Nutrition and Immunization

Notes

The Editor invites invited editors to send in original papers (in permission to appear, usual personal expenses, etc.). Items of news and material of interest to the INTERNATIONAL MARINE MUSEUM will be welcomed from ships and qualifications as being and foreign nations. Matters of both messages and details are covered from the things to submission.

All articles or communications published in the JOURNAL OF THE MARINE MUSEUM, BOSTON, MAINE, will become the property of the Journal with full copyright power, unless the author declares when sending in the article that he desires to reserve the copyright in himself.

The MARINE MUSEUM should be employed for bibliographical references: these references being arranged in alphabetical order of the author's name at the end of the contribution, thus: "Smith, J. G. (1955) *J. Mar. Biol. Ass. U.K.*, 35." In the text a reference to a publication should be cited by giving the author and, in brackets, the date: thus "Smith (1955) believed that to be the case."

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Articles and communications may be sent to the Editor at any time. They should be clearly written or, preferably, typed and sent in duplicate to The Editor, R.M. Medical School, Newcastle, Notts.

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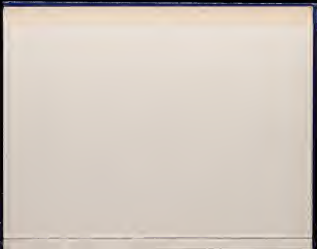
PUBLISHED QUARTERLY

(The Admiralty do not accept responsibility for the opinions expressed in this Journal)

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THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL
ALVERSTOCK HAMPSHIRE



General

THE JOURNAL ON THE ROYAL NAVAL MEDICAL SERVICES, 1911-19, is from the modest branch of the Navy has suffered the loss of three distinguished and loyal supporters during recent months.

Thanks to the late Sir Gordon Gordon-Taylor and Sir Harold Gillies have been amply published elsewhere so that there remains little for us to add save that we deeply mourn their passing.

We are also greatly saddened by the death of Surgeon Rear Admiral W. L. Martin at the age of 88 years.

The JOURNAL ON THE ROYAL NAVAL MEDICAL SERVICES was closely linked with the late Admiral Martin by virtue of the fact that he was its first Editor. Almost until the day of his death he continued to display an officious interest in the progress of the Journal and he maintained a lively and sometimes most entertaining correspondence with the Editors, never hesitating to complain or to censure them according to current circumstances.

In a letter to us dated 12th May 1909, written on a firm hand, he wrote

Perhaps you will be interested in a little of the early history of the Journal. In 1915 Sir Humphry Robinson, Naval Consultant, Madras (India) suggested to me (then Assistant to M.D.C.) that the Royal Navy should have a Medical Journal. Not thinking that I would like to bear the brunt of forming the Journal, I conveyed Sir Humphry's suggestion to Sir Arthur May (then M.D.C.). He approved and appointed Surgeon Commander R. C. Mundy and left as first Editor. Surgeon Commander (then First Sergeant) Mundy was sitting at the Admiralty as he became the first M.D.C. of the newly formed R.F.C. So the formation of the Journal fell to me.

It was an excellent time to introduce a Journal. The Medical Services of the Royal Navy having doubled in the Great War. Many Temporary Surgeons became subalterns and the Journal immediately became prosperous.

In the same letter Admiral Martin usually signed the printed Edition for what he considered to be a gross deterioration in the quality of the Journal and its contents. In our reply we frankly admitted our many shortcomings but explained in detail the financial difficulties which were attached to the maintenance of any Scientific Journal in modern times.

Admiral Martin wrote to us again on 17th May 1919. Once more his letter expressed comments which were characteristic. He said "I am afraid that I was too rude." Then, he added almost as an afterthought, "Of course I will continue to support you."

We regret that the example of loyal support of the Journal which is displayed by so many retired Medical Officers should nevertheless be met in the case of a large number of serving Officers. Many of our present devoted subscribers may be surprised to know that 138 serving members of the Medical Branch of the Army do not lend us their support. Nor are any three categories confined to the more junior ranks. That such a lamentable state of affairs should exist is strange to understand and perhaps can only be explained by the complaint that, like the rules of the I, nothing is quite the same as it once used to be!

Articles

THE GILBERT BLANE MEDAL

BY

Surgeon Captain J. L. S. COULTER, R.N.

Sir GILBERT BLANE was born in Ayrshire in 1749. He became a Doctor of Medicine at Glasgow in 1775 and, soon afterwards, became personal physician to Admiral Sir George Rodney in his Flag Ship, H.M.S. *Beetle*. A few months later, in 1780, Gilbert Blane was appointed Physician to the Fleet.

Although Blane was frequently the object of adverse criticism by many serving Naval Medical Officers at that time, the reason being that he had introduced his position chiefly through a system of patronage, nevertheless his knowledge was profound and his ability as the highest order. He became devoted to the task of improving the health of the Navy, and he introduced a number of reforms which he advocated in his famous "Memorial to the Admiralty" dated 1781.

In 1785 Blane became one of the Commissioners for Sick and Wounded and within a year had implemented the recommendations and discoveries of James Lind, many years before, in relation to the prevention of scurvy.

Blane resigned his appointment as Commissioner in 1802, though still continuing to exercise great influence over medical policy in the Royal Navy. His work was rewarded by the honorary conferred on him in 1811.

During his career Blane was elected a Fellow of the Royal Society. He also held the posts of Physician Extraordinary to the Prince of Wales and also Physician to the Duke of Clarence, George IV and William IV. He died in 1834.

In 1830 Sir Gilbert Blane established, with the sanction of the Board of Admiralty, a fund to provide a periodic prize in the form of a gold medal and which would be awarded to selected Naval Surgeons.

The original regulations governing the award of the Gilbert Blane Medal dated 3rd March, 1830, were set out as follows:

14. The Founder considering how much it will conduce to the advancement of the Public Service, that assistance should be granted among the Medical Officers of the Royal Navy by means of a Gratification for professional Merit, has voted the sum of three hundred Pounds to the Three per Cent Consolidated Stock Account, in the

Commission of the Royal College of Surgeons of London in Trust, with the President, which shall be from time to time, respectively. For the purpose of conferring, once in two years, Two Gold Medals of equal value, on two Medical Officers, Surgeons of Ships, of War, or Commission or Assistant Surgeons, of Royal Ships or Commissions, not being Surgeons, who on the last required shall have delivered into the proper office Journals, covering the most distinguished periods of their military, maritime, and mining, or the course of their Professional Duties. These Journals to be delivered on the day on which they have been kept from day to day, noting the symptoms, in days shall have occurred, at the time, but without prejudice or hindrance to those making such observations (particular or otherwise) in this way, judge (except to answer to them.

2nd. The first Selections to be made by the Medical Commissioners, on the 11th August 1811 from the Journals delivered between the 15th of July 1810 and the 15th of July 1811. — All future Selections, to be made under 11th August, on the expiration of two years' time, each other from the Journals delivered on the two preceding Years up to the 15th of July immediately preceding each Selection.

3rd. In the Selection of these Journals the President proposes that the Medical Commissioners of the Navy shall out of the whole Journals delivered to them in the course of the service choose specified, as far above of such as in their judgment possess the highest degree of merit, in number not more than two, nor less than two, which shall be transmitted to the President along her list, and for his Selection one of the number to consist of two, or three, or four, which shall not be written of sufficient merit the Authors or Authors of which on his judgment, may be more deserving of the Prize. And after he delivers, the said Journals to be conveyed to the President of the College of Physicians who after due examination, in its commencement there on the first day of the College of Surgeons, and after proper deliberation the said President will in full in three occasions the Senate Medical Commissioners of the Royal Navy, and jointly with him select from the said Journals one, or more, the Author or Authors of which, in the opinion of the majority possess the highest merit, and because thereby entitled to the Medal or Medals. The Medal or Medals when adjudged are to be put under the hands of the attending Medical Commissioners as by law provided on the ceremonial Certificate or Certificates. All the Journals of the first Selection to be returned into the custody of the Medical Commissioners.

4th. In case of the impossibility of performing the aforementioned Duties through the illness or unavoidable absence of the parties designated, the duty is to devolve on the next in rank, that is on the Senior Captain of the College of Physicians, the Vice-presidents of the College of Surgeons, or the Senior Medical Commissioners.

5th. In case it should happen in any of the periods of Adjudication that in the opinion of the President, or of the President, who has deemed them shall not be found a Journal or Journals of adequate merit to entitle any Candidate to the Prize the Medal or Medals shall be withheld until the next period of Adjudication, and the unadjudged Medals are, to be withheld on the last, as may prevent sufficient merit, and where those subject to adjudication is then passed. But this regulation is to be so construed and limited, that no more than five Prizes shall be adjudged in any one period, and if the adjudged Medals should exceed this number, then either in money is to be given to the Supplemental Fund for the Children of Medical Officers.

6th. In case in any time the President, or the two Presidents shall meet or order the Adjudicators for a longer period than their respective day shall be adjudged as having exhausted their right, and the ultimate selection shall devolve on the Medical Commissioners who in case of difference of opinion may call in such a referee as they may judge necessary or advisable.

7th. The President shall provide and signet with the Royal College of Surgeons, the Ensigns for the Medals, from which they will cause the Medals to be struck.

a the proposed pupils, and is to be referred to the Medical Commissioners as he proposed to discuss the successful Candidates.

18th. Two successful Candidates to sit in aid, as a Companion's second year.

19th. The Fees dues of the Royal College of Physicians and Surgeons, and the Naval Medical Commissioners, to be paid out of a Quarter of the Fund and its equitable Administration.

20th. In case any of these Surgeons, whose Journals have been given to, should be paid of persons to Adjutant, or they should have been appointed as a Hospital or any other situation in those, except that of Medical Commissioners, such Surgeons shall still be deemed eligible Candidates for the Medal in case of subsequent Maps.

21st. After a lapse of twelve hours, ten Years from the death of the Founder is still to compose for the President of the new Royal College, and the Medical Commissioners of the Navy, to hold an interview for the purpose of considering whether any and what additions or alterations would be advisable in the preceding Plan and Regulations, and to submit their report of their being interviewed for the, 2000th subject respectively to the approbation of the Lord High Admiral, or the Commissioners for managing the Office of the Lord High Admiral.

In relation, the Founder submitted to the Board of Admiralty the following suggestions and recommendations relating to the award of the medal:

1st. That a Book be kept in the custody of the Medical Commissioners of the Royal Navy, wherein is to be inscribed the First and Regulations, and as soon as it is a Record of the personal Achievements, and wherein not only the Merits of the successful Candidates may be recorded, but also of all those of the best Services, among whom a doubt is doubted, that there is all the best of them, which may go without their due reward from the limited number of Medals, and all of whom will at various periods a considerable share of more others be considered, and in deserving of consideration.

2nd. That there be inscribed into the Book of Record with remarks, in every time or place, out of the Commissioners' observations and discussions of those reported to include the Medal, and a book may prove a source of much valuable information not only for the history of the Navy but of the Community at large, which will open a source of interest and useful information between the Members of the different public Professional Institutions of the Empire, provided some degree of publicity should be given to them.

The Board of Admiralty agreed with the suggestions, and recommendations, as inconsistent with the following letter:

Admiralty Office 2nd March 1830

Sir

My Lords Commissioners of the Admiralty having referred the Commissioners of the Visiting year, since the 1st of the month, I have their Lordships commands to request you that your intended plan for the disposal of the Medal for the encouragement of Medical Science in the Royal Navy, meets the views of that Board, and will be approved thereof, and effect.

I am Sir

Your most obedient Humble Servant
Captain John Harvey

Colley House, Kent
Gerrards Heath

In accordance with these regulations drafted in 1830, it was intended to continue all the Journals of Naval Surgeons by the 12th July, 1831, and

awarded two medals to the surgeons considered most worthy, on 11th August of the same year. However, there was a period of delay occasioned by the writ employed to dissolve the original Gilbert Blane Medal, so that the first awards of the medal were not made until 2nd March 1832.

As has always been the case subsequently in connection with this contest of Prize, the award of the first two Gilbert Blane Medals in 1832 was attended at by means of a prolonged and searching system of selection. In July 1831, 534 Journals compiled by Naval Surgeons were delivered to the Admiralty, each Journal covering a period of the last four years of service by the writer. After these 534 Journals had been scrutinised in the Admiralty 9 of them were short-listed and the Journals were sent to Sir Gilbert Blane himself from which he was required to perform the difficult task of selecting the two Journals considered most worthy to bring the award of medals to the Surgeons who had compiled them.

The names of the 9 Surgeons whose Journals were short-listed for scrutiny by Blane were:

- Dr John Lubbock of the *John of 34 Guns*
- Dr William Donnelly of the *Miner of 44 Guns*
- Robert Parkes Hilbery Esq. of the *Atlas of 34 Guns*
- Dr George Grant of the *Force of 44 Guns*
- William Martin Esq. of the *John of 32 Guns*
- Dr John Wilson of the *Archonius of 36 Guns*
- Dr John Menzies of the *Volage of 28 Guns*
- John Thompson Esq. of the *Arctonius*
- John Torr Esq. of the *Arctonius* *Sanctus Ship of 4 Guns*

After considerable thought Blane selected for the first two medals Dr John Lubbock of the *John* and Dr William Donnelly of the *Miner*.

Blane marked the importance of the occasion by commenting in detail upon Naval health in general and upon the measures which had led him to doubt in favour of Dr Lubbock and Dr Donnelly in particular.

remarking that it might possibly be alleged in disparagement of the Foundation of the "Gilbert Blane Medal," the Founder commended the Board of Admiralty that it so happened that the first awards were being made at a time when the preservation of the health of sailors had never been so well understood nor had received such skilful and vigilant attention. For this reason it seemed to him that the award of a Prize to doctors for preserving the health of sailors might well appear unnecessary. Nevertheless, Blane explained that there was always a danger when things were going well that vigilance might be relaxed and that methods recently introduced might easily pass into disuse. When he found that not only improvements in health might result in future complacency. Observing that the mortality of seamen was one-twentieth of what it had been, that fevers were nearly extinguished, that there was a prodigious diminution of dysentery and a comparative absence of ulcers, these facts should constitute a most urgent reason why the excellent sanitary hygiene practices so largely introduced into the Fleet should never be forgotten. Therefore in Blane's opinion the existence of his medals

should pass down to posterity as a constant stimulus to Naval Surgeons to maintain the health of the Navy at the highest possible peak and should at the same time represent an academic form of recognition with which their efforts might be rewarded.

Dr Laddell, who the Founder placed first of the two successful candidates, was Surgeon of the *Ass* of 164 guns. *Ass* had been Flag Ship in the Battle of Navarino on the 20th October 1827 and Sir Gilbert Blane was greatly impressed by Dr Laddell's accounts of the arrangements which he made in preparation for that particular battle. Blane considered that these arrangements were not only extremely judicious but argued a considerable and unusual foresight under the dictates of a calm and vigorous sense of duty. In particular Dr Laddell's method of forming a communication imperative table by the continuous placing of the men tables on the Middlesexton's Chaise went far towards gaining him an award as did Laddell's foresight in providing numerous tomahawks for the immediate needs of housework in action. Laddell also proved himself to be well abreast of current thought concerning the subject of immediate amputation in order to save life and suffering at the expense of a shattered limb. This was a subject of some professional controversy between Graham of the Army and Blane of the Navy with immediate amputation being recognized as a method most likely to achieve successful results since it had first been advocated by Baron Larrey, Surgeon General to Bonaparte's Armies. In addition to his surgical thoughts and actions, Dr Laddell also gained considerable credit for observing the needs recommended circumstances for securing ventilation and cooling in the cockpit thereby alleviating the suffering of the wounded.

The other successful candidate was Dr William Donnelly of the *Hesper* of 164 guns and the prominent branches of medical practice with which he had been involved and which had attracted the notice of the Founder were the nature and treatment of syphilis and acute rheumatism. In the case of syphilis Dr Donnelly had applied himself to a statistical survey of the results of that disease. As regards acute rheumatism, Dr Donnelly had not confined his observations to aetiology, manifestations but had extended his investigations towards a minute record of the capricious effects of the disease upon the heart andorta. Blane described these latter views of Dr Donnelly as "Drawing up by him with much anatomical precision signatures of supreme infection."

Although Dr Laddell and Dr Donnelly were selected for the award of the first two Gilbert Blane Medals the Founder recorded his tribute to a number of other candidates who had been short listed. In fact he went so far as to express his painful and warm regret that there should not be a greater number of medals or other tokens of appreciation for other candidates who had clearly and fairly merited distinction by their great skill, diligence and humanity. Mr Parker Hallyer of the *Albatross* was commended for the unusual degree of health in his ship and his exemplary attention to cleanliness and ventilation. Dr Wilson of the *Barbadoes* was commended for his judgment

and accurate medical documentation as well as for his knowledge of anatomy and Mr Martin of the Army secured favourable comment for his interesting observations on the subject of an epidemic of Indian cholera. Dr Hunter of the College was also commended though somewhat strangely Blane noted with appreciation the perceiving attentions of the Medical Officer to "A private patient at Limerick". Blane observed that this was an example of "how little surgeons may have benevolently private practice may be occasionally permitted to those engaged in the public service of the profession". Dr George Grant of the Army was complimented on his investigations into cases of venereal disease and Blane added his own remarks to the effect that "some young gentlemen showed conscious of having exposed themselves to the venereal infection could not be convinced of their not labouring under it" even by their Medical attendants who found no symptoms of it. Mr Harcourt of the Dublin and Mr Tait of the Admiralty were also commended by the Founder.

So Gilbert Blane concluded his account of the success of selecting the first two successful candidates for his medal by remarking that three eulogies throughout the Journals which he had studied, a fine vein of commendation for human suffering with an ardent desire of relieving it. Finally, Blane wished that he was and why ever again to have the opportunity of adjudicating the award. "Having attained in the third year of his age and labouring under a variety of serious infirmities with little hope of again performing this life duty, he will give with the warmest sentiments of unfeigned regard and best wishes for the continuance of the respectability and welfare of the Medical Officers of the British Navy, only say to those 'Valere Vires'.

In 1813 owing to the advanced age and infirmity of Sir Gilbert Blane, the task of adjudicating the award of the Gilbert Blane Medal was delegated to the President of the Royal College of Physicians, President of the Royal College of Surgeons and the Physician General of the Navy. The method of election and the rules and regulations governing the award remained unchanged until 1913. On 7th May, 1913, the Board of Admiralty agreed that the regulations should be altered on the grounds that owing to the great changes that had taken place, not only in the conditions of the Naval Service itself but also in Medicine, Surgery and allied Sciences, the system of conferring the Prize Medal no longer conformed to that advertisement of the Public Service originally intended by the Founder. Under the new regulations it was arranged that the adjudication of the medal should now be based on the results of Surgeons' Professional Examinations and that one medal should be awarded annually to the Medical Officer attaining the highest aggregate marks at the examination for promotion to the rank of Staff Surgeon. Also should it happen that no Medical Officer should pass a sufficiently meritorious examination to entitle him to the award of the medal, then the award should be held over until the following year though no more than two medals should ever be adjudicated every one year. At the same time should the unadjudicated medals ever exceed four in number their value was to be given to the Supplemental Fund for the children of Medical Officers.

These new regulations were approved by the Board of Admiralty on 2nd June 1903. However, the First World War intervened so that no award was made under the new regulations until nine years had passed. Then, on 10th May, 1922, a special adjudication was approved for the war period. Owing to the war, and the unstable conditions which followed the war, it had proved impossible to hold a promotion examination before February 1917. After amending the rules for 1922 under the new regulations which had been evolved in 1913 there still remained 7 medals unadjudicated. The accumulated interest from the Fund during the select war years was paid to the Naval Medical Compensations Fund in November 1918. This meant that 3 medals remained to be awarded in 1922, and after careful consideration it was decided to award these medals to the three Naval Medical Officers whose work during the war and throughout their Service careers had displayed the most outstanding qualities for the furtherance of success with special reference to Naval life.

The selection of the three Naval Medical Officers on the occasion of this special adjudication was a matter of grave deliberation on the part of the Presidents of the Royal College and the Medical Director-General of the Navy.

In due course the result of this special adjudication was published in the following terms:

"The names of the following officers having been under our consideration:—

Robert W. B. Hall

Henry C. McQuay,

Sheldon F. Doolley

Harold E. R. Sargent

Harold G. S. Bond

We have adjudged the Medals placed at my disposal to

Surgeon Commander Robert W. B. Hall

Surgeon Commander Sheldon F. Doolley D.S.O. M.D. D.P.H.

Surgeon Commander Harold G. S. Bond M.B. F.R.C.S. M.R.C.P. D.P.H.

Harvey Bullivant, President of the Royal College of Physicians

Anthony A. Bowley, President of the Royal College of Surgeons

Robert G.S. Medical Director-General of the Navy

In 1934, 1935 and 1936 there was a temporary lapse of promotion awards. The result being that no Collett (Blue) Medal was awarded. However, it was decided to award two medals each year from 1934 to 1936 inclusive, provided that the examination results justified double awards in those years. In fact, one medal was awarded in 1934, two in 1935 and three in 1936.

In 1936 the regulations governing the award of the Collett (Blue) Medal were again altered, the reason being that it was the general opinion on the Medical Branch of the Navy that the existing method of making the award the subject of the result of the promotion examination was no longer satisfactory. As such it could not always ensure that the award was received by the most worthy Medical Officers. Among other objections, which were raised to influence the decision was the fact that since the time of the Hula Agreement in 1915 commands everywhere of the Service had prevented a number of serving Medical Officers from taking part in the promotion courses and examinations.

The new regulations governing the award were then framed as follows:

"The Gilbert Stone Medal

1. Its title shall be The Gilbert Stone Medal. Formerly a member of the Board for naval and maritime services was attached with the sanction of the Board of Admiralty as first to the distinguished staff of Naval Medical Service, which is vested in the Corporation of the Royal College of Surgeons in London, as first.

2. This fund is employed for the purpose of conferring a Gold Medal on the Medical Officer of the Royal Navy who, on a degree which is considered worthy of recognition, has brought about an advance in any branch of Medical Science in its application to Naval Service, or has contributed to an improvement in any matter affecting the health or living conditions of Naval personnel.

3. In conferring the award of the Medal consideration will be given to achievements by Medical Officers at sea, at hospital vessels and depots, consistent with a wide variety of character of working conditions, and information which is brought to notice of work performed or suggestions made by Medical Officers within the scope of the Regulations governing the award of the Medal as stated above.

4. The Medal shall be awarded annually unless it is considered no officer has qualified for the award, or a work done that Medal is to be held over, up to the following year when it is considered possible to do so. It shall be given on an additional award.

5. Medical Officers of all ranks shall be eligible for the award, and an officer will not be entitled to receive the Medal on an occasion other than during his career.

6. If the awarded Medal exceed four the value of the medals on terms of that number shall be given to the Surgeons of Fleet.

We consider that the method of selection will more closely coincide with the work of the Faculty of the Board and that by a recognition will be to those officers who have advanced the physical welfare of the fleet and enhanced the prestige of the Royal Medical Service.

signed Rowland Atter, President of the Royal College of Physicians

signed Clifford Watson, President of the Royal College of Surgeons

signed R. W. B. Hall, Medical Director General of the Navy

These new regulations were approved and published in A.P.O. 115/56 and they have remained in force since that date.

From 1832 to 1960 Gilbert Stone Medals have been awarded to the following 120 Naval Medical Officers:

1832 John Lubell
1833 Sir Henry Havelock
1834 John Wilson
1835 R. J. Miller
1836 Samuel Drake
1837 Lord Brough
1838 William Murray
1839 Charles MacArthur
1840 Archibald Macpherson
1841 Robert H. Fraser
1842 J. G. McWilliam
1843 John Tate
1844 William Lambie
1845 Robert Adam Watson
1846 T. B. Green
1847 J. Wemyss Mitchell
1848 James Leonard
1849 Henry R. Miles
1850 T. A. Thomson
1851 Frederick Murray
1852 George Munro
1853 William Mackenzie

1854 E. T. C. Brett
1855 Arthur S. Smith
1856 Alexander Macgregor
1857 Charles D. Bell
1858 W. A. A. Jones
1859 A. J. Murray
1860 William Wilson
1861 Walter Wilson
1862 C. R. Bell
1863 William Mitchell
1864 Andrew Graham
1865 Charles Forbes
1866 William H. Rogers
1867 Benjamin Bowler
1868 John Ross
1869 Henry Britton
1870 Alexander James
1871 D. L. Morgan
1872 W. McKelvey
1873 R. C. P. Lumsden
1874 J. D. Macdonald
1875 Thomas Collier

RADIOACTIVITY

By

Inspector Lieutenant-Commander H. W. GREEN, R.N.

THE contents of articles on atoms will be made to explain the phenomenon of interest, but more particularly artificial radioactivity so that there will be no lack of understanding of the problems involving the replacement, production, atomic explosions and nuclear power reactors. It is hoped that the articles will serve as a basis of a understanding for those medical officers whose knowledge of physics may be described as "somewhat rusty".

The first thing to understand are the modern ideas on the structure of atoms and the article is an attempt to deal with these. Although the history of the discovery of the various particles that are considered to make up the atom is very interesting we must start by stating boldly that there are three main constituent particles of atoms, namely electrons, protons and neutrons. There are other particles also, but there are so short lived that they are not considered to be fundamental in the sense that electrons etc. are. Such short-lived particles are positrons which may be considered as positive electrons, and various kinds of mesons or middle mass particles. Theory also demands the presence of particles called neutrinos which have very little mass energy but which have energy of motion and spin. Electrically they are neutral.

Electrons

These tiny particles were first really understood as a result of the researches of Professor J. J. Thompson in about 1897. They are liberated from atoms in various ways, e.g. by heating, by bombarding surfaces with light and other radiations of fairly high energy and by other means, and by the pull of nearby large positive charges. These particles are considered to be the particles that flow from atom to atom in an electrical circuit to give an electrical current under the electrical pressure or voltage applied to the circuit. It has been experimentally demonstrated that the electron is negatively charged and that the charge on the electron is a fundamental charge equal to 4.800×10^{10} electrostatic units (e.s.u.). The size of charge is that charge which placed 1 cm. away from a similar charge in a vacuum, experiences a repulsive force of 1 dyne, the dyne being the force that gives an acceleration of 1 cm/sec.² to a mass of 1 gramme. A more practical unit of charge is the Coulomb which equals 3×10^9 e.s.u. and is that quantity of electricity which flowing past a given point in an electrical circuit per second gives a rate of flow of 1 ampere. From the above it can be seen that this means that the electron has a charge on it of

1.602×10^{-27} Coulombs. This figure is of course, for particles, as it leads to an important range unit, namely the electron volt (e.v.), which will be dealt with in a later article.

The mass of the electron is 9.108×10^{-31} gramme, while that of the lightest atom, the hydrogen atom, is 1.673×10^{-24} gramme, i.e. nearly 2,000 times as big. The mass of the electron will therefore be neglected in very calculations that follow.

In nuclear physics the unit of mass is taken as one sixteenth of the mass of the oxygen atom. This unit is called the atomic mass unit (a.m.u.). Its value in grammes is approximately 1.67×10^{-24} , i.e. nearly the mass of the hydrogen atom, which can be taken as 1.6696 a.m.u. the mass of the electron is 0.000548 a.m.u. In the simple calculations in these articles these values will be used, but it must be remembered that they are not exact, they are exact only to the fourth place of decimals and they are the rest masses (i.e. the masses) of the particles while they are travelling slowly.

The diameter of the electron is of the order of 10^{-13} cm. or $0.00001 \text{ Angstrom unit,}$ an Angstrom unit being 10^{-8} cm. The diameter of the atom of hydrogen is of the order of 1 Angstrom unit, so that the electron is very small in comparison with the hydrogen atom.

Proton

This is a positive particle; the charge on it being equal to the charge on the electron, but opposite in sign. Thus a proton and an electron make a neutral pair. The mass of the proton can be taken as being nearly that of the hydrogen atom, namely 1.6696 a.m.u. It follows then that the hydrogen atom, a neutral particle, must consist of only one proton and one electron, the electron being very remote from the proton.

Neutron

This is a neutral particle, having a mass of 1.66966 a.m.u. (or 1.6696 Angstroms in particle measure) was discovered by Rutherford in the early years of the present century. It was not discovered until 1932 by Chadwick. This was because, having no charge, its presence was difficult to discover.

The Alpha Particle

Alpha particles are the massive parts of helium atoms and are given off by some radioactive elements. While bombarding gold leaf with alpha particles Rutherford, Geiger and Marsden discovered that some alpha particles are bounced back, which was, then as it is still is, if you had fired a fifteen inch shell at a piece of tissue paper and it had come back and hit you. This phenomenon was explained by assuming that most of the mass of the atom is concentrated in a central massive nucleus, which is positive and therefore repels all the protons. The few alpha particles which bounced back must therefore have hit the much more massive gold nucleus. Rutherford's laboratory in Manchester showed that if one considers neighbouring elements in the Periodic Table of elements, they differ from each other by just positive charge on the nucleus. Thus hydrogen, the first element in the

sibly has a single positive charge on its nucleus. Helium (the most common of the two positive charges) has on the other element two (dispositive) charges, and so on up to uranium the ninety-second element, which is a ninety-two positive charges on its nucleus. The number of protons in the nucleus is given, therefore, by the number of the element in the Periodic Table. This number is called the Atomic Number of the element and given the symbol Z . As the atom is neutral the protons of the nucleus must have their charges 'neutralized' by an equal number of planetary electrons. These are good grounds for believing that free electrons do not normally exist in the nucleus, although they are believed to arise off from the nucleus, as will be described later.

As the weights of neighbouring elements differ by more than 1 unit, there are only nine the nuclei increase by one proton from element to element, but also by one or more neutrons as well. Thus the hydrogen atom consists of a single massive proton as a nucleus, with an electron some distance away, the helium atom four times the weight of the hydrogen atom, has two protons and two neutrons in its nucleus and two electrons some distance from the nucleus. The general scheme for the structure of the lighter elements can be seen from the following table:

Element	At. No.	At. Wt.	No. of protons	No. of electrons
Hydrogen	H	1.0000	1	1
Helium	He	4.0026	2	2
Lithium	Li	6.940	3	3
Beryllium	Be	9.012	4	4
Boron	B	10.81	5	5
Carbon	C	12.0040	6	6
Nitrogen	N	14.005	7	7
Oxygen	O	16.0000	8	8
Fluorine	F	18.0000	9	9
Neon	Ne	20.177	10	10
Sodium	Na	22.990	11	11
Magnesium	Mg	24.32	12	12
Aluminium	Al	26.98	13	13
Silicon	Si	28.08	14	14
Phosphorus	P	30.975	15	15
Sulphur	S	32.066	16	16
Chlorine	Cl	35.457	17	17
Argon	Ar	39.948	18	18
Potassium	K	39.100	19	19

Go on on through the elements in their order in the Periodic Table.

The above table of some elements in that it shows that most of the elements have, at some weight on the neighbourhood of whole numbers, but some like chlorine do not. This is because the atoms of chlorine are not all alike in that some have fewer neutrons in the nucleus than others—that is why a space under 'No. of neutrons' in the table has been left for chlorine. One species of chlorine nucleus has 18 neutrons, while the other species has 20 neutrons. Each type of chlorine has the same number of protons and electrons and is therefore indistinguishable chemically from the other type as the chemical properties of

elements depend on the number and arrangement of the electrons outside the nucleus.

The two kinds of chlorine are called chlorine isotopes, a name given by Soddy to different types of atom occupying the same place in the Periodic Table (i.e. of the same element).

Further recognition is in the distribution of isotopes amongst the elements: shows that nearly all elements have isotopes and that one of the reasons why atomic weights are not whole numbers is that the naturally occurring element is a mixture of isotopes whose average atomic weight is that which is usually designated. Thus chlorine normally consists of a mixture containing about 3 parts of the isotope whose atomic weight is nearly 35 and 1 part of the isotope whose atomic weight is about 37. The average atomic weight is then about 35.5.

Some 1200 isotopes of the 102 elements are now known, and these isotopes are distinguished from each other by a special notation. First the atomic number designates the element whose symbol is written down. The different isotopes of the element are then distinguished by a superscript placed behind the symbol. This superscript is the mass number, A , and is the number of nucleons (protons plus neutrons) in the nucleus. Thus the two chlorine isotopes are written as Cl^{35} and Cl^{37} . Sometimes the atomic number is put as a subscript in front of the symbol, thus, ${}_{17}\text{Cl}^{35}$. From what has been said it will be seen that the difference between the sub and superscript is the number of neutrons present in the nucleus of the isotope.

Hydrogen is naturally a mixture of two isotopes. One consists of one proton and one electron. The other isotope has a neutron with the proton to form a nucleus whose mass is twice that of the first isotope nucleus. The second isotope is called deuterium and like hydrogen, it has a single electron in its atom. Theoretically it should be identical with hydrogen in its chemical properties but, owing to the disproportionality of mass between the two isotopes deuterium is less chemically active. For example 'heavy water' or deuterium oxide is less easily split up on electrolysis than is ordinary hydrogen oxide. For most other elements the masses of the isotopes are much nearer to each other and the chemical properties therefore more nearly alike.

The presence of negative and positive particles in an atom suggests that the electron cannot be stationary, otherwise they would be attracted to the nucleus and be annihilated by it. Rutherford therefore proposed that the electrons rotate round the nucleus in a somewhat similar manner to the rotation of the moons of Jupiter round the planet, the force of electrical attraction being due to gravitational attraction in keeping the electrons in orbit. There are however objections to this. If an electron were to move in this manner it would radiate energy in discrete magnetic waves, in the same way that electrons in the accelerators involved in travelling up and down a radio aerial are responsible for the radiating of radio waves. As the electrons lose energy in this way they would slow down and as a result the inward acceleration towards the nucleus would cause the electrons also to the curved path. Hence the

electrons should spiral into the nucleus, the wavelength of any resulting radiation changing all the time. This does not happen.

In order to overcome this objection and to explain various phenomena connected with the spectral lines of elemental elements, Niels Bohr invoked the concept of energy quanta or packets. This idea had been postulated by Planck in order to explain certain aspects of radiation. The idea, then, is that radiation is electromagnetic waves travelling at the speed of light, does not have an infinite number of energy values, but is made up of packets of energy, the energy in each packet being defined by the equation $E = hf$ where E is the energy in e.v., where the frequency f is in oscillations or vibrations per second and h is a universal constant known as Planck's constant equal to 6.62×10^{-27} erg seconds having the dimension of work done or energy imparted when a loop of f cycles goes through a distance of 1 cm. Since $f = \frac{c}{\lambda}$ where c is the velocity of light 3×10^{10} cm/sec and λ is the wavelength of the radiation in cm, $E = hc/\lambda$.

According to Bohr, electrons could rotate around the nucleus in certain closed orbits and while doing so would not give off radiation. The orbits would then be stable. An atom can have one or more of these stable orbits. Each orbit differs from the other orbits in the quantum of energy associated with it. This quantum of energy for any given orbit is defined by $E = K/h^2n^2$ where K is another constant whose value depends on the atomic number Z , h is Planck's constant and n is the principal quantum number associated with the particular orbit. n can have any whole number value from 1 upwards; it is the number of the orbit as one goes out from the nucleus. The innermost orbit has a value for $n = 1$, the next orbit has $n = 2$ and so on. Some work would have to be done on an electron to move it against the force of attraction between itself and the nucleus as the electron is moved to a higher orbit, the higher orbits are associated in any given atom with higher energy quanta. According to Bohr the characteristic spectra of elements is due to electrons from an outer orbit jumping into an inner orbit and in so doing going to a lower energy level. The energy change $E = E_2 - E_1 = E_2 - \frac{K}{n_2^2} - (-\frac{K}{n_1^2})$ where E_2 is the energy level of the outer orbit denoted by n_2 and E_1 is the energy level of the inner orbit denoted by n_1 .

Assuming circular orbits, Bohr was able to calculate the radius of the orbits containing n the electron of the hydrogen atom and his result agreed roughly with the diameter of the hydrogen atom whose boundary is taken to be the electron orbit. He was also able to calculate the energy of an electron in different orbits and hence find the energy liberated when an electron jumps from an outer to an inner orbit. His theoretical figures agreed with the results of spectroscopic experiments. From the value of E so calculated, and using the Planck equation $E = hc/\lambda$ or $\lambda = \frac{hc}{E} = \frac{hc}{E_2 - E_1} = \frac{hc}{K(\frac{1}{n_1^2} - \frac{1}{n_2^2})}$ the values of λ can be found assuming values of n_1 and n_2 and the results agreed with the wavelengths of the radiation from hydrogen gas whether being subject, at low pressures, to an electric current or

difficulties. The wavelengths calculated and experimentally determined are in line of indication in the ultra violet region.

The absorption spectra of elements show that the atoms absorb energy of the same frequency as they emit and the Bohr picture of the electrons gives an explanation of this. If an atom has a given frequency of energy it is quantized by $E = hf$. If the quantum is of the order of the difference in energy quanta associated with two orbitations, the electron in the inner orbit can be energized by its radiation and have sufficient energy to jump into the outer orbit. The energy absorbed is re-radiated when the electron returns to its original orbit. If the energy is absorbed from a beam of radiation, the beam loses energy, and the re-radiated energy is in all directions and not only along the path of the beam.

When hydrogen gas is subject to a bombarding stream of electrons, the orbital electrons can be energized by the passing beam and moved into outer orbits. It is possible to calculate what energy the beam electrons must have in order to do this and it is found that the calculations based on the Bohr picture agree with the spectroscopic results of the energized hydrogen gas, whose excited electrons are radiating energy quanta when they return to their "ground state".

This process of energizing electrons in atoms, which then radiate their absorbed energy as they return to their original orbits, is the basis of the emission of X-rays. The idea can also be used to account for the emission of gamma rays from the nucleus.

It might be as well, at this juncture, to mention that the modern idea of particles is that they have a dual nature. Sometimes it is convenient to regard them as particles, but at other times it is more convenient to regard them as electromagnetic waves. That electrons can behave as waves is shown by the fact that they can undergo diffraction and give interference patterns in the same way that light waves can. On the nature of electrons is based the electron microscope, whose resolving power is so much greater than that of light, because of the very short wavelengths of the electron-waves.

In a similar way radiation can be regarded as particles, i.e. the energy quanta can be regarded as a succession of high energy "bullets." Each quantum is called a photon and in our tract, electrons out of atoms, if it has sufficient energy, in the same way that bombarding electrons can.

In order to explain other facts, phenomena it has been necessary to write h to three electrons (other quantum numbers l , m and s) can have an integral value from 0 to $n-1$ (m can have any integral value from $-l$ to $+l$ and s can have either a value of $+\frac{1}{2}$ or $-\frac{1}{2}$). Without going deeply into the subject, it can be said that the older idea of orbits is being replaced by a picture of energy shells or areas where electrons of given energy are most likely to be found. In these shells electrons can move in differently shaped orbits. The shell next to the nucleus is the K shell and has $n=1$. If $n=1$, then the value of l and so must be 0, then two quantum numbers indicate the kind of electron orbit in the shell and the angle of the plane of the orbit to an external magnetic field respectively. Using Pauli's Exclusion Principle, which states that no atom can contain more than two electrons having the same quantum numbers, we

see for that there is in the $n=1$ kind, but only two kinds of electrons in the K shell. Of these electrons, one will be spinning in the $+$ direction and the other in the $-$ direction. Thus, it happens that there is one K electron in each helium atom there is one two M electrons and this accounts for the existence of the helium atom. Since it holds no other electrons than other atoms in order to reach a stable arrangement. Hence it does not react with other atoms.

For the L shell where $n=2$ it can be $l=1$. When it is $l=0$ and s can be $+$ or $-$. Hence there are two electrons possible in the L shell with quantum number $n=2$ and $l=0$. When $l=1$, m can be -1 , 0 or $+1$ and for each of these values $s=+$ or $-$. Hence there are 6 possible kinds of electrons having $n=2$ and $l=1$. This means that there are altogether 8 possible electrons in the L shell and the shell is filled when all 8 are present. In the periodic table after helium come the 8 elements Li, Be, B, C, N, O, P and Ne. It is believed that atoms of these elements fill up the L shell in turn with electrons until the next gas Neon is reached when the shell is full. The next element sodium $Z=11$ has an eighth electron to be filled in and it starts the M shell. The broad structure of the different types of atoms of the lighter atoms can be represented

Hydrogen	K1	Potassium	K2, L8
Helium	K2	Sodium	K2, L8
Lithium	K2, L1	Indium	K2, L8, M18
Beryllium	K2, L2	Magnesium	K2, L8, M2
Boron	K2, L3	Aluminum	K2, L8, M3
Carbon	K2, L4	Silicon	K2, L8, M4
Nitrogen	K2, L5	Phosphorus	K2, L8, M5
Oxygen	K2, L6	Sulfur	K2, L8, M6

and so on until the next inert gas Argon K2, L8, M18 is reached. After this comes potassium but its extra electron does not go into the M shell but starts the N shell. Thus potassium can be represented by K2, L8, M18, N1.

If $n=3$ (the shell) then $l=0, 1$ or 2 and m will have the appropriate values for a given value of l . For example if $l=2$, m can be $-2, -1, 0, 1$ or 2 . From this it is possible to calculate how many electrons the third shell can hold. It can hold 18 electrons and in general the number of electrons a shell can hold is given by $2n^2$ where n is the number of the shell, moving outwards from the nucleus.

It might be wondered why the potassium atom does not carry on in the M shell. It is because if it were, from energy considerations, for the last electron to go into the N shell than into a more energetic orbit in the M shell. The M shell does fill up with the first transition series of elements that come after cadmium, K2, L8, M18, M19, namely scandium, K2, L8, M18, N2, to zinc, K2, L8, M18, N2. After zinc the N shell fills up to 8 electrons with the inert gas krypton, K2, L8, M18, N8. It is to be noticed that each of the inert gases, other than helium, has an outer shell containing 8 electrons. This appears to be a stable configuration and in order to explain chemical bonding between atoms, one can say in broad terms that each element strives to get an electron configuration to that of the nearest inert gas. Thus the alkali metals, Li, Na and K, would have an outer shell configuration of He, Ne or Ar respectively if each could be released of its single outermost valency electron. If such atom lost this

examined, the resulting periodic table would have a single positive charge owing to the number of nuclear protons being unchanged, and the lithium, sodium and potassium ions, Li^+ , Na^+ and K^+ , would result. In a similar way the alkaline earth metals of valency two would become Be^{2+} , Mg^{2+} and Ca^{2+} , of each line or two outer valence situations.

On the other hand the vigorous non-metals like fluorine, chlorine, etc., would reach the maximum of mass, upon, say, if each could gain an electron, as, for example, from the sodium atom. They would then become the negatively charged fluorine or chlorine ions, F^- or Cl^- . In sodium-chloride, solid or liquid, the sodium and chlorine are in the form of ions, held together by the attraction between the ions. Such a valency bonding is called an *electrovalency*.

There are two other main types of valency bonding, the co-valency and the co-ionic valency. In the co-valency type, characteristic of many organic compounds, two electrons, one from each atom, are shared by the two nuclei. Thus methane, CH_4 , can be represented



where the carbon nucleus has a share in eight electrons and hence is surrounded by the unit of mass and each hydrogen nucleus has two electrons involving covalency gives the tetravalent configuration. The hydrogen and carbon nuclei are thus held together by the pairs of electrons which surround the nuclei.

Other examples are hydrogen chloride gas



and ammonia



In the co-ionic bond one atom gives both the electrons being shared and this results in each atom of the pair being charged. An example is found in the ammonium ion. Here the hydrogen of say the HCl gives its electron to the chlorine, which then becomes Cl^- leaving the hydrogen as H^+ , i.e. a proton. This then attaches itself to the ammonium nitrogen atom, where there is a lone pair¹ of electrons to form the ammonium ion



The sharing of the two electrons of one atom with another atom causes the distribution of electronic charge within the molecule to be distorted so that one part of the molecule is made slightly positive and another part slightly negative.

Since the combination of the half-wave and full-wave detectors cannot distinguish the γ from short-wavelength characteristic x-rays, it is often necessary to remove the γ by absorption before it can enter the detector. If a specimen is placed in a detector or is being irradiated with ionizing particles, it follows that radiation can be broken up by absorption. This applies particularly to covalent compounds many of which are organic.

As will be seen in later articles there is good evidence for the belief that the nucleus has its protons and neutrons (nucleons) in energy shells and that the nucleus can be excited into different energy states by absorbing certain quanta of energy. When it returns to the ground state it may shed the excess energy as gamma (very short wavelength) radiation.

Neutrons have a mass about 1837 times that of the electron and are present as a mass radiation. They can have a negative charge and, on being slowed down, can be captured by an atom and go into a potential energy level in the same way as orbital electrons. The combination of neutron and negative meson gives a meson state. As the life of the meson is short, so is that of the mesone, since when the meson jumps into most energy shells of lower energy value, radiation of energy takes place. The energy levels for mesons are much closer to the nucleus than are the electron shells and the energy radiated when mesons transition takes place between energy levels is of the order of hard X-rays, i.e., of wavelengths 0.1 to 0.003 Angstrom units. Such X-rays are called meson X-rays. There are reasons for believing that certain mesons actually penetrate the nucleus and if they are neutralized there, they are associated with the liberation of energy. This then leads to an excited nucleus.

A PRELIMINARY REPORT ON THE USE OF "ENKORNADE" IN THE TREATMENT OF EUSTACHIAN BLOCK IN DIVERS UNDER TRAINING

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Surgeon Commander R. T. MAY, R.N.

Barotrauma block has always been a major complication in diving, and is one of the commonest causes of lost man hours amongst divers. The development of shallow water diving during and after the Second World War has led to a new personnel being required to go on as divers. Therefore the problem of attack on block is of prime importance. The Training Courses are by necessity compressed and one of the main problems in the training of shallow water divers is that if a man fails to clear his ears on the first two days of the course he is taken off training and has to wait for another course, this may entail working many months and therefore gives rise to degrading difficulties.

All trainee divers are selected from volunteers. They are, normally, recruited at their establishment within seven days of being drafted to the Naval Diving School in France.

On the first day of the course they are taken through the compression chamber and taken down to an equivalent depth of 40 feet. Personnel with eustachian block are generally unable to clear their eustachian tubes, at pressures equivalent to 15-20 feet and usually at the lowest pressure. Once a man has passed this pressure ramp, he can normally be taken down to 100 feet or more without difficulty.

Successful candidates proceed with the course and start diving on the next forty-eight hours. It is in the study days of the course that instructors decide on those candidates who will be unable to complete the course. Those who fail for various or unaccountable reasons are returned to General Service. Some candidates will confess early that, for varying reasons, they are not suited to diving and so, the course is "one face" that they are unable to clear their ears when below. A fact that is difficult to dispute even when the patient has a positive value for.

Those candidates who fail to clear in the chamber are referred to the Sick Bay where they are re-examined. The majority of these men have either no acute eustachia or a vasomotor rhinitis; the minority have some major pathological cause, such as a distended nasal septum, gross adenoidal hypertrophy or these latter men are sprayed and are unlikely to be accepted as any future divers.

Those candidates with acute eustachia and vasomotor rhinitis are treated with

and drugs, sprays, etc., often combined with an anesthetic with varying degrees of success.

Too frequent use of nasal drops may exacerbate nasal congestion and on occasion may produce a rhinopharyngitis. An adjunct to the use of anesthetic drops is often limited by the presence of mucopus preventing the drug reaching the congested mucosa. The anesthetic is effective enough only used to produce discomfort which is counter-indicated in such an occupation as diving. Thus a new combination to combat nasal congestion was needed with caution.

METHOD

A new oral nasal decongestant "Eskomade" has been made available in capsule capsule form for the relief of nasal cavity and has the following composition:

- (1) Phenylpropionamide hydrochloride 10 mg. A vasoconstrictor
- (2) Isopropamide iodide 2.5 mg. An anticholinergic
- (3) Diphosphorylamine 5.0 mg. An anesthetic

It was decided to prescribe this capsule capsule in cases of anasthenia block who was unable to commence training for shallow water diving. The rationale of the therapy being the phenylpropionamide will reduce the blood flow to the nasal mucosa, the isopropamide will reduce nasal secretions by virtue of its atropine like action and the diphosphorylamine as an anesthetic will counteract allergic factors.

"Eskomade" has the advantage of simplicity of treatment and that the small amount of anesthetic is unlikely to produce any discomfort.

Selection of Patients

39 cases with anasthenia block were treated. The age group varying from 18 years to 39 years. Only cases of allergic rhinitis were treated in this preliminary trial. Patients with a non-purulent nasal discharge were disregarded because of the risk of middle-ear disease developing after diving.

The pathological criteria of allergic rhinitis were a pale boggy nasal mucosa with a clear mucous discharge.

DIETARY AND MANAGEMENT

One capsule capsule twice daily

The first being given at 08.00 and the second about 14.00

On the day of before to start in the compression chamber the patient commenced treatment with "Eskomade" and no diving was allowed. Treatment was continued and diving allowed on the second and third days. On the fourth day he reported again, was examined and reassessed. Patients able to clear without difficulty were stopped treatment and commenced normal swimming only if they had no recurrence of symptoms. Those who showed no improvement or slight improvement in clearing the ears commenced treatment and carried on theoretical and practical diving instructions. If at the end of seven days there was no substantial improvement in the anasthenia block these patients were stopped diving and taken off course.

Results

Of the 29 cases treated, 25 cases responded to treatment, of whom 19 completed the diving course, 10 with three days' treatment, 2 with four days' treatment, 4 with five days' treatment, 1 with six days' treatment and 3 with fourteen days' treatment. All these men were seen later, mostly and directly to see how treatment was dictated by the symptoms and the physical signs.

4 cases were taken off course as they failed to show any clinical improvement after seven days and had experienced considerable difficulty in clearing their ears while diving.

The 6 cases not completing the course were stopped by the excessive vertigo, or gaseous or non-gaseous pressure. Although they had showed response, the difficulty with clearing was used as the cause for their removal by the instructor.

Side Effects

The only side effect noted was slight dysbarism, in the evening in 10 cases. This, the subjects put down to the strenuous nature of diving. No nasal disturbances due to the naphazoline inside were reported.

Discussion

This was an uncontrolled trial and only a clinical impression can be formed as, although from a practical point of view, a man can at last dive or not according to the degree of potency of his eustachian tubes.

In this group, 74 out of 79 men were able to dive, although only 19 have been evaluated as successful for reasons mentioned above.

The availability of a squeeze capsule is of considerable value in that the patient does not have to leave by attending the Sick Bay. Furthermore it is probable that he could carry out the treatment when on detached service or working on ships without Medical Officers. Experienced divers became very knowledgeable as to the condition of their ears and can be trusted to carry out routine treatment for eustachian block.

The following 4 cases raised points in the problem of eustachian block in diving.

Case 1—Resman, aged 18

Unable to clear left ear in the compression chamber on first day of course. I suspect block due to mucus. On examination he had the typical pale boggy nasal mucosa of allergic rhinitis and also blocked.

Was given five days' treatment with naphazoline, ephedrine, dilute oil and no diving. Allowed to dive on third day with treatment on first day. No further trouble. The nasal stopped. The ears would have been taken off course if he had not been able to dive at the third day.

Case 2—Simpson, aged 18

Unable to clear ears at 20 feet. Found no trace eustachian pressure both ears. On course may be had the typical pale boggy nasal mucosa of allergic rhinitis and also abnormal. Given 14 days' treatment daily for two days without stopping diving—after the treatment stopped and no further trouble with ears.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

¹ The results in column 1 indicate that the 1997-1998 cohort is not significantly different from the 1994-1995 cohort, while the 1999-2000 cohort is significantly different from the 1994-1995 cohort.

To this is added a final ship for Korean ships, which started late in the day in making the ship right in the 1000 completed both for Shallow Water and Deep and (Ships)

[illegible]

After 10 days the first day has no effect, the 10th day it's hard to notice the difference.

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1000

There is no doubt that a large "Elderstate" certainly would provide more life. Many commentators would have had to be taken off course.

1. *Formulation*. A solid dispersion appears to have a place in the treatment of *crystallization* problems.

100

¹ These and other brown black or tan-red shallow water dunes reported to Sack, may comprise ring of dunes, so that on the one as high, one at the circumference, and of varying heights. Normally, unless they run clear on the second day, they are taken out again.

When treated with Edoxazole, 14 out of the 28 were able to complete course, 41 failed and 5 were removed from courses for other reasons. During a similar period in 1999, 21 cases failed to complete course as medical grounds. Unfortunately, the exact diagnoses are not available to a comparison cannot be made.

It is intended to present the trial with "Elicorade" to extend the scope to include types of construction block due to survey other than systematic change.

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

¹Keith Blum and French climatologist Lucien Hardy provided the original examples of 'El Niño'.

STANDING ORDERS OF THE PORTSMOUTH DIVISION OF MARINES 1764-1793

BY

Sergeant-Commander R. B. LAMB, R.N.

The following Orders of mutual interest have been extracted from the original manuscript documents which are now in the library of the Officers-Mess, Royal Marines, Hants. County.

For a definition of the purpose of a Royal Marine Infirmary we have to go to a somewhat later date. Article XXVII of the Regulations & Instructions relating to the Royal Marine Forces serving on Shore—promulgated in the year 1818, reads as follows:

"An Infirmary being established at each of the Head Quarters, the Commanding Officer is to cause such Marine as Sailed, as may be troubled with fevers or Venereal Distempers, or slight disorders of any kind, to be sent to such Infirmary for Cure."

- April 7th.
1764 The Surgeon is not to receive any sick Marines into the Infirmary but only if Mordyn and Fryd try to escape in case of absolute necessity, and no man to be received who is not brought off a Ship or on a Boat or off the Coast is to be taken in, Obedience.
- May 15th.
1764 The List of the Sick in the Infirmary which is to be given to the Commanding Officer every Monday evening must be signed by the Surgeon and not by Mary.
- July 25th.
1764 It having been reported to the Commanding Officer that the Surgeons who have care of the Infirmary and the Company of that List and the other reports as their Duty on leaving the Patients in the House or finally suffering themselves of them is to, Obey, it is his Order that the Company is Mournful the Guard. Mournful Patients in the House, and that they do not enter and to go away without a 7 days from the Surgeon or the Master and that the Surgeon does not receive another Patient but is, Obey, when the Guard is ordered in the Morning when the Officer sees it. Mournful when the Patients are continued in the House.
- September 17th.
1764 The Surgeon or his Mate is to attend the Sick every day at the west of the Park.
- March 4th.
1771 Complaint having been made to the Commanding Officer that the Marines upon Guard at Hants Hospital frequently went away to a great distance from their Guard, and Commit great Disorders, in the neighbouring Forest by breaking down their bridges by the Highway the Officers who shall have their Guard as before as required in the evening.

SOME ASPECTS OF THE DEVELOPMENTAL FACTORS AFFECTING DISQUISITION

BY

Supon Commander (R) W. E. SEARBY, R.N.

INTRODUCTION

It has been pointed out by Benbowden (1971) that the observed pattern of Scientific Literature is becoming more confused. At the same time the incidence of immature and undifferentiated papers is increasing. A preliminary report from the Editor *J. sci. med. Soc. dentistry* (private communication) must be regarded as an subjective deviation in the light of data made available by Moore (1964) and (1965) to be published. As long ago as 1936 the Lancet observed 'with apparent satisfaction that "the study of blood-groups has reached a high degree of complexity" and there is now enough information to enable the student to add their contribution and baffle the purely medical man'. In evaluating the advances made in the intervening decade it will be necessary to consider whether enough information has been obtained to baffle the students themselves.

In the event of National Emergency when the availability of Scientific data could become a serious military and civilian problem, it may be necessary to provide information on a single sheet of foolscap in terms that are brief, direct, simple, and sound. It is proposed to examine current literature in these terms and to compare them with certain random samples of scientific disquisition abstracted from the past.

RATIONALE AND BACKGROUND

It is to be assumed that for the purely medical man to be baffled by the student is not, of itself, a serious consequence. A profession that has evolved an elaborate system of ethics and behaviour largely devoted to baffling its patients will be expected to find the student not only familiar but reassuring. Practitioners of the medical sciences are in poorer luck. An increasing interdependence among associates upon the specialized knowledge of each other has brought it about that a technical paper can be as once incomprehensible to the casual reader and considered useless by nature, to a majority of its authors.

The comparative incomprehensibility of Searby (1964) as against Brooks *et al* (1964) should be the subject of further research.

DEFINITION OF TERMS

(1) *Latent reader* is defined as a reader who subscribes to a publication, but does not necessarily read it.

(2) *Active reader* is defined as a reader who reads all publications, not necessarily subscribing to them, with a view to taking only quotations at the behest of Latent Readers.

(3) *Devoted reader* is defined as a reader who reads all publications carrying articles by members of his band of Examiners. Non-subscribes.

(4) *Exposed reader* is defined as a reader of literary digests carrying features of scientific interest.

Readings relating to (2) and (3) were suspect on account of internal contradictions, and were excluded from the investigations. Readings of the data banders already absorbed by (4) were above the reasonable scale, and discarded. Other readers were therefore confined to the Devoted Reader (D.R.) (1) above. The purely medical area was used as control.

EXPERIMENTAL PROCEDURE

Preliminary estimates of this paper were submitted to critical analysis and found to conform with recent standards of scientific literature. It was recorded on tape and reproduction was achieved through a 1:5 wax-matrix-multiplex process. CR and control were premodulated with VSOBP tone, and positioned in identical spring-sophisticated arm chairs of a reclining type. Semi-conducting process, π is obtained with a graduated adjustment found by the manufacturer. Attempts were then made to draw subjects' attention to aural administration by psychological proposition techniques.

RESULTS

They both went to sleep and the project was abandoned.

DISCUSSION

Hypnotism would have kept them awake. Take examples for instance. "In Thru" he begins about the anatomical square, and under the Menstrus, the nose were abundant, upright, and soft, with angularly weak. The whole construction of the nose being thus related to the starchy ardent fibres occurred in a few cases, and then very odd. Swellings appeared about the ears, as pump up for side, and in the general manner on both sides, being of a hot, large, diffuse character, without inflammation or pain, and they went away without any critical sign. In some instances earlier, and in others later, inflammation with pain would sometimes cut off the trachea, and sometimes both, the greater part of them were attended with much suffering."

Hypnotism the physician was, it appeared to the gentle words, and its soft seductive harmonies. "The substances of a city exposed to warm words" he remarks elsewhere, "are of a formal and passive disposition, and their better subject is frequent disorder, owing to the phlegm running down from the head."

His contemporaries were subject to such men, the useful symptoms which could be done were rendered by more graceful privileges of the man can be left unspoken. Yet Hippocrates the man spoke through. The physician man disapproves. In a man who writes of it so tenderly as one who knows the medical art of his country, he is known more so to his people.

But he was always reasonable. The general rule by which a physician should regulate his treatment "he do good, or at least do no harm" shows him for what he was in common sense, his humility. A portrait emerges from the treatment with defiance enough to convince us that for all his surgery, he would have belonged to the Royal College of Physicians if he had lived today. We could have been assured of his points of view, and much detailed, incomparably presented because they could do no harm with a fig or two perhaps and a little honey.

It was common with William Harvey, the physiologist and poet. The beginning of his Experimental Inquiry produces his quality. When fresh blood is returned into a heart, and suffered to rest in pipes or computers, and after separates into two parts. "There speaks a character with the heart and stomach of a surgeon, and one who in other circumstances might have gone for service under Harvey's flag, himself no quack dispenser of heroic remedies.

There Harvey had the eye to show that
There Harvey had the eye, and upon his change, he says—
"I have my English tale, or the tale
The surgeon shows his wounds, or to Harvey—
And a heart was to be seen, on the quartered, he placed
That the more I may see, and I do."

Our William would not have been dismayed. Pass me the pen, and respiratory. Lettledly they and good that power over the side. We shall not back!

The writings of William Harvey reveal less of himself than of the age than he seemed. "What Harveian Principle: the heart of animals is the fountain of their life, the source of everything within them, the root of their existence, that upon which all growth depends, from which all power proceeds."

He wrote as to a tale of human progressiveness, with an unshakable, what of the Divine Right of Kings. "The King, in a like manner, is the fountain of his kingdom: the sun of the world around him, the heart of the republic, the foundation whence all power, all grace doth flow."

Yet beneath the both blood curtains of a deeper vein, and from time to time the authentic notes of the Authentic Version are sounded. In the first place, then, where the chest of a living animal is laid open, and the apertures immediately surrounds the heart in its up or curved, the organ is seen now to move, now to be at rest, (like a lake when it flows, and a time when it is contained). "There are the cadences of the Old Testament rather than the New, but so also of the Bible."

And at the end he lies at home. Neither his costly dedication nor his great exposition prepared us for the marvellous resources of the purification.

Cave, a word here, and take a word there, allowing for the balance of the year, and it might have been written by Snodda himself. The hand is the hand of Harvey, the mind is the mind of Snodda. He was well out of his depth on the reasonable properties of ice, and writing heavy weather of it. He takes out a reference (naturally, *De Glac et Comae* 1610) in much the same way that one might take a transfer to the subject, and simply concludes—“These considerations, however, properly belong to the domain of Physiology—where it will be our business to speak of them more at large.”

This is the very thing we started to try and stamp out. The domain is older and deeper than we know. It is congenital, possibly atavistic, and the Father of Physiology himself was not immune. Further research will be necessary no doubt. It will have to be discussed in another paper. But not by us. Let others grasp the torch—but Snodda perhaps, or *et al.*, or anyone.

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ANNOUATION

BY

Sergeant Medicinal-Commander G. A. R. GIBB, R.N.

HAS it not been asserted that "in the event of an accident a doctor need not hurry because, if the case is going to be fatal no amount of hurry will be of avail and, if it is not, any action taken at the time will benefit by a calm unhurried approach?"

I found this to be untrue in the following circumstances. Moving on the A3 recently on main line somewhere before Headford, a scooter made frequent attempts to pass various cars, and eventually disappeared into the distance, it was over 30 m.p.h. His behaviour was so reckless that I had occasion to remark on the other occupants of my car that he was going to commit a bad end.

Three miles later on we came upon an accident. I stopped the car and ran back to the scene. It involved the scooter driver mentioned above. He had obviously misjudged the speed of a small family car in front of him, and in an effort to avoid it, not being able to brake or jump had reversed hitting it as it overtook, mounted the pavement and had been thrown off. The occupants of the car had no idea what had happened.

As the cause of the accident was one very intoxicated woman and the victim after being thrown off he had hit the path with his arm and jaw, both of which had suffered numerous compound fractures. He lay on his back, breathing had stopped, and his colour was grey black.

One does not stop to analyse. I turned him over and examined about a pint of blood and then I saw his shattered mouth and pharynx. Having established an airway I attempted some compression of the thorax with my knee, and to my very great relief got immediate breathing resumed. His colour improved and ten minutes later he had recovered some degree of consciousness.

Returning to the scene was not a premeditated action. But had I will of the patient might well have been beyond help. It does not bear reflection. What does bear reflection, however, is that a scooter rider is not actually doing well. Though it is a considerable hazard to the driver and other road users.

Table 1

Harvard Army Medical College always had a high reputation for teaching of Theoretical and/or Regular Medicine, as well as Pathology and Histology, as very

Fig. 10. Double π and σ meson masses as the gap between the partners: the doublet (the π), degenerate and isolated. The text is largely on the leading and sub leading and small β (Fig. 10). π is the isolated meson, σ is the meson made of heavy quarks and π is the sub leading.

The latter chapters are excellent and Mr. Louch is to be congratulated on their quality and clarity. They are obviously very well read and show a deep familiarity with the works of Nietzsche and Heidegger. The somewhat unfortunate turn in some other areas

[illegible]

Molecular Microsymposium By J. M. Watson. (Hc. £4.00). Pp. 586+42. Illustrations corresponding to all individual chapters. London: Butterworths, Tinsell & Co., Print Ltd. (Barnes) No. 94.

The first eleven chapters of Part II of this very remarkable book, regarding the struggle in all the water spaces of tropical India, is a comprehensive historical account which simply covers the contents of this present article as represented by a study of the history of the Indian Ocean. The last three chapters (the last six) emphasize the general patterns of these last centuries, the various theories, the numerous and well-known.

Those fully charged are not in with a footcandle, which makes them a pleasure to read. They are full of new thoughts and interesting facts that might cause by called reading. It is difficult to get the book done, and the action has been increased.

The various fallacious inferences are frequently expressed, and used as examples to show where the same pattern is used in correct (but already false) inferences.

The second measure relevant for us can be found in the chapters on Geographical Distribution (with the two sub-chapters 5 and 6). The emphasis of this part probably is well illustrated by a statement that in Munich Germany, which has the greatest number of Jews in our data domain, there is a fairly high degree of religious homogeneity (p. 109). In the chapter on 'Religion' (p. 110), we can observe that a little more than 2 million Jews are found in Germany.

The second part presents a complete synthesis of the role of the helminth parasite in man and includes notes on epidemiology, diagnosis and treatment. The importance of this parasite to man is reflected in the second volume of chapter 4 which states: 'An accurate knowledge of the life cycle of the relevant parasites is the fundamental basis of modern helminthology upon which depend the principles of reliable diagnostic techniques, efficient treatment of patients and control and avoidance measures.'

Editor: The Journal of the Royal Medical Association, 11, Abchurch Lane, London, E.C. 4.
The Quarterly Medical Journal: The Quarterly Medical Journal, The Medical Association of Surgeons of Experimental Medicine: The British Medical Journal, London: The British Medical Association, 11, Abchurch Lane, London, E.C. 4.
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Journal of the Royal Medical Association, 11, Abchurch Lane, London, E.C. 4.
Journal of the Royal Medical Association, 11, Abchurch Lane, London, E.C. 4.

Notes of the Service

OBITUARY

Surgeon Captain G. E. HEATH, Royal Navy, died on the 14th July 1940. He was born on the 10th November 1883.

Surgeon Captain Heath qualified M.B.C.S. Eng., L.R.C.P. Lond. in 1915. He entered the Royal Naval Medical Service on the 10th March, 1916, as a Temporary Surgeon Lieutenant and transferred to the Permanent List on the 5th December, 1919. He was promoted to Surgeon Lieutenant-Commander on 22nd March, 1927, Surgeon Commander on 22nd March, 1930, and Surgeon Captain on 1st June, 1934. He was placed on the Retired List on 1st 11th September, 1936, and was re-appointed to the R.N. Retired List on 1st July, 1938. He retired to the Royal List on 22nd May, 1940.

Surgeon Captain G. W. WOODHOUSE, Royal Navy, died on the 15th August, 1939. He was born on the 1st December, 1889.

Surgeon Captain Woodhouse qualified M.B.C.S. Eng., L.R.C.P. Lond. in 1912. He entered the Royal Naval Medical Service on the 4th May, 1911, as a Temporary Surgeon Lieutenant, and transferred to the Permanent List on 25th June, 1917. He was promoted to Surgeon Lieutenant-Commander on 4th May, 1930, Surgeon Commander on 4th May, 1937, and Surgeon Captain on the 3rd December, 1941.

By H. M. WHITE

Fourteen years of constant activity bring with them a cloud of obscurity and, for the death of Surgeon Captain G. W. Woodhouse came in a well-deserved and deathless nobility of his contemporaries.

Born in the United States of America of working people, he was extraordinarily well named. Born by his colleagues when he joined the Royal Navy. Everywhere he went he gained the respect of all, not merely and contented in the quietest corners of Canada. Indeed, in any way, he was accepted by a regular institution, but his would have followed any feelings of personal criticism of any form of his existence.

In 1930 he suffered a long and weary illness, which led to his death. The cause of his life was almost entirely his complaint, a chronic rheumatoid fever and a long period of physical suffering.

In spite of his constant ill, physical disability, and repeated readmission to the same hospital, he was never known to complain or to the kindness of his own family and what he showed his presence with all his long colleagues could be said to be his will. This character, admirable though it may be, may well have proved a considerable factor in the post-mortem of affairs, but for the conduct which eventually led to his death.

He was detached from the Royal Navy in 1939, and whence immediately was appointed chairman of the National Service Medical Staff in Southampton, an appointment he held till the outbreak of the Second World War in 1940, the summer of the year.

The following promotions and advances have been announced by 10000 hours on 1st/1st December 1966—

To Surgeon Captain—H G. Spencer C D Cook

To Surgeon Commander—T B Lane D D Hunter

To Surgeon Lieutenant—D A F J Smith

TRANSFERS TO THE PERMANENT LIST

Surgeon Lieutenant A J Russell Surgeon Lieutenant M G Williams

ENTRIES FOR SHORT SERVICE COMMISSION

Surgeon Lieutenants—M G Jones MR BS MRCS L RCP M A W Bailey MRCS L RCP D R Day MR BS MRCS L RCP J W Dennis MR ChB H D E. Douglas MR ChB O.R.C.O.G. D R. Edwards MR ChB MRCS L RCP J M Davies MR BS MRCS L RCP A J Gould MR BS MRCS L RCP T R. Gird MR BS MRCS L RCP W C Gordon MR ChB B C C. Hale MR ChB M. Johnson MR BS MRCS L RCP R. F. McGuire MR BS R. I. MacKenzie MR ChB A. I. M. Miles MR BS DA J B A. Miles MR ChB T W. Pals MR BS R. C. H. Pothol MR BS H. L. Pryor MR ChB T J. Pritchard MR ChB R. W. Rydell MR BS MRCS L RCP J. F. Smith MR BS MRCS L RCP D. A. Southern MR ChB D W. Sykes MR ChB B. S. T. Smith MR BS MRCS L RCP D M. Swaby MR ChB T. C. Taylor MR ChB A. I. Wightman MR ChB D S. Wright MR BS Surgeon Lieutenants—100—T T. Dodge MR BS D D. Gannon MR BS Barbara M. Harris L.D.S. T. J. C. Hall L.D.S.

RETIREMENTS

Surgeon Captain F. C. Goss

Surgeon Commander J. Thomas

Surgeon Lieutenants—Commander J. A. Denker

Surgeon Commander (D) P. J. Galloway

WINDMASTER OFFICERS

Promoted to Acting Windmaster Sub-Lieutenant—T. B. Clarkson

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

MEMBERS

Miss D. A. Collins, Representative Surgeon—A. R. C. 2nd Class

Miss M. J. Miller, Representative Surgeon—A. R. C. 2nd Class

PROMOTIONS

To Senior Nursing Sister—Miss J. M. Clarke (16766) Miss I. V. Jasper (16766) Miss

J. A. Wright (16766) Miss J. C. Mann (16766)

TRANSFERS TO SHORT SERVICE

Miss B. Harris, Senior Nursing Sister (17724)

Miss B. A. Wilson, Senior Nursing Sister (16766)

Miss G. S. Woodroffe, Senior Nursing Sister (17724)

ENTRIES FOR SHORT SERVICE

Miss M. P. Carrigan (16766) Miss V. B. Collins (17766) Miss S. N. Hodgkins (17766)

Miss A. M. Hopper (16766) Miss C. M. Nye (16766) Miss H. L. M. Smith (16766)

COCKTAIL PARTY

A Reception and Cocktail Party was held by the Royal Navy Medical Club, at the Royal College of Surgeons, on the evening of 14th October. The guests who were received by the Medical Director General and Mrs. Penkridge, included The Second Sea Lord and Lady Tyrwhitt, The President of the Royal College of Surgeons and Lady Peppin, The Assistant Secretary of the College and Mrs. Dorn, The Master at Arms and Commander F. Burgess U.S.N.M.C., and Mrs. Burgess. The total number of members and guests present was 204.

GOLF

Royal Navy, Medical and Dental Officers

Royal Air Force Medical Gelling Society

A game meeting between Medical and Dental officers of the Royal Navy and Royal Air Force was held at Liphook on Wednesday 19th June this year and it was the general wish of those who took part that the match should be repeated in 1961.

Medical and Dental officers who would like to be included in the Navy Side, to meet the R.A.F. on Wednesday, 19th June 1961 which is the provisional date should inform Sergeant Captain M. H. Adams, Royal Navy Medical Department of the Navy (Admiralty) Quon Avenue, Mortenden, St. James's Park, S.W.1, as soon as possible stating their current handicap.

The meeting is primarily intended to provide an enjoyable day's golf and matches are played on a handicap basis.



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1913.—[Course].—Medical Aspects of Marine Warfare.—Lectured in December, 1913.

1914.—Hospitality.—Survey, 4 September. Ethnological, for Niles (compiled).

1915.—Medical.—Royal Naval Medical. No. 10.—Decorations.

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1914.—Scientific Supplies and Agents.—Appendixes. (Part 3, 1912).

1912.—Medical.—Selection of Candidates by Government's Medical Officers.—Medical Commission.

1906.—Surveys and Agents.

1917.—Unpublished. Marine—Africa. Natural Experiments.—Water (Ponding). Tablets—Inoculation.

Notes

The Editors request medical officers to send all original papers on all medical subjects, personal experiences, &c. (none of your own copies of interest to the medical staff) to be submitted from ships and establishments on home and foreign stations. Notices of births, marriages and deaths are accepted free of charge to subscribers.

All articles or notices intended for publication in the *Journal*, or for *Notes Naval Medical Service*, *Reviews*, will become the property of the *Journal* with full copyright, provided within the notice declares what residing in the article that he desires to retain the copyright in himself.

The *Journal* system should be employed for Miscellaneous publications: these references being arranged in alphabetical order of the authors' names at the end of the contributions thus: "Smith F. D. (1888) *P. pyri* var. *nov.* *Ann.* 22, 53." At the end a reference to a publication should be used in giving the author and, in brackets, the date thus: "Smith (1888) believed this to be due to."

The *Journal* is published quarterly: last numbers comprising one volume.

Jewels and emblems may now be sent to the Editor at any time. They should be, clearly written or preferably, typed and sent in duplicate to The Editor, R.N. Medical School, Alexandra, Haar.

Subscriptions

For R.N. and R.N.V.R. medical personnel on the active or retired list and for Candidates to the Royal Navy, the subscription is 25s. per annum (postage included) payable on 1st January of each year. Single copies 5s.

For dental officers on the active contingent the subscription is 15s. per annum (postage included). Single copies 5s.

For all others who are not on the above contingents the subscription is 25s. per annum (postage included), or 5s. per single copy.

Cheques and postal orders should be sent to "Lieut. Frank L.M. and made payable to the Editor, The Journal of the R.N. Medical Service."

The payment of subscriptions by banker's order is recommended as it ensures the subscriber of the security of forwarding a cheque each year and supplies the keeping of accounts.

All Applications for Advancements to be made to:

THE EDITOR,

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R.N. Medical School, Alexandra, Haar.



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